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THE PHILOSOPHICAL REVIEW

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THE PHILOSOPHICAL REVIEW.

WHY THE MIND SEEMS TO BE, AND YET CANNOT BE, PRODUCED BY THE BRAIN.

IF an electric current is applied to the closed eyelids we have a sensation of colour, if to the ears, a sensation of sound, if to the tongue, or nose, a sensation of taste or smell. What is apparently one and the same stimulus applied to different sense organs gives rise in the brain to different sensations. It seems easy to explain this by what we know of the anatomy and physiology of the brain. When our sense organs are stimulated, the stimulus is conveyed by means of sensory nerves to the brain and there gives rise to sensation, the sense organs are sensitive to various kinds of stimuli, the stimulus to the eyes gives the sensation of sight, to the ears the sensation of sound and so on. It seems then it must be the brain which gives the special character of our sensations to consciousness, for we have only to send the brain a stimulus through the optic nerve to get sight, through the auditory nerve to get sound and so on, and this notwithstanding that the stimulus has in itself none of the things which we distinguish as sensible qualities. Since it is out of sensations that all knowledge is built up, for there is nothing in the nderstanding which was not first in the senses, it seems to follow that our mind, that is the power or faculty we have of perceiving, remembering and imagining, must be produced by the brain, that is, be an effect of some process or other that goes on in the brain.

But it is not only by experiments such as this that we make the discovery that there is a close and intimate relation between the

mind and the brain, a relation which makes the mind dependent on the brain. In ordinary discourse we use the words brain and mind as interchangeable terms, because it is quite evident that where there is lack of intelligence there is deficiency in the brain and where there is a high degree of intelligence there is a correspondingly high development of brain. The immense advance in recent times in our knowledge of the physiology of cerebral process serves more and more to emphasize the entire and absolute dependence of mind on brain, and particularly of the higher processes of mind on the development of the cells and fibres of the cerebral cortex. Physiologists tell us that there are the almost inconceivable number of something like 7000 million nerve cells in the brain of the newly born child and these, which neither increase nor decrease throughout life, undergo a development of interconnection by means of the branching fibres they send out in every direction. When through disease or malformation or any other cause this development is arrested we have mental deficiency or idiocy.

The brain is an organ of immense complexity and has a great deal more to do than only to turn stimuli into sensations. It is part of a complete nervous system and it is only a part of the brain that is concerned in mental process. A nervous system or something that closely corresponds to it seems to be a necessary acquirement of every living organism that moves freely, and its structure, however complex it may be in its higher development, is built up of a simple arrangement of cells and fibres that receive and transmit movement. Its function is to receive a stimulus and to transmit it to a centre where a responsive movement is prepared. The nervous system is therefore described as sensori-motor from the double function that it performs. There are two kinds of response to a stimulus—one immediate and automatic, the other conscious and willed. It is only those stimuli that are transmitted to the cerebral cortex, and only some of these, that give rise to consciousness; consciousness seems to occur just at the moment when the movement in the fibres reaches the cerebral cortex; some of these movements, not all, give rise to consciousness. If a movement gives rise to con-

sciousness it occurs when a stimulus reaches the cortex and before it passes from the brain to the muscles to issue in actions. There appears to be a power of inhibiting or delaying the response to the stimulus while consciousness lasts and consciousness seems to have the function of giving us a choice of the direction which the response shall take.

Moreover, if we sever the connecting fibres between the sense organs and the brain, all sensation and all thought ceases. This seems to indicate that in some way or another the movements that pass to the nerve cells of the cerebral cortex are there transformed into sensations, thoughts and ideas, into what we group together and think of as a different and separate kind of thing and call the mind. And it seems impossible to doubt that it is the brain that produces the mind and not the mind that produces the brain, because the brain is an organ that develops continually throughout life and performs a multitude of other functions besides that of turning the excitation of its cells and fibres into sensations and perceptions, a function that seems to be intermittent and only called into activity at definite times and in special circumstances.

Many people think that our nature is a combination of two realities, a soul and a body, and that the mind belongs to the soul, which is immaterial or spiritual, while the brain belongs to the body, which is material. If this should turn out to be true, or even if it should appear to be credible, it does not alter the fact we are considering. No one can produce for his own or for someone else's observation a soul that is independent of a body or a body (that is of course a living body,—a dead body is merely inert matter) that is independent of a soul. Therefore those who hold that there are two independent realities have to admit that everything happens just as if processes in the brain produced feelings and thoughts in the mind of the soul.

Why should they not? Why should not feelings and thoughts be manufactured in the brain just as any effect is produced when its necessary conditions are fulfilled? May it not be the function of this wonderfully complex organ to produce mind just as other less complex organs produce the secretions that are necessary to

the life of the whole? Is it only the subtlety and ethereal nature of the product that make it seem inconceivable that mind can arise from a material process? If so, is there more than a difference of degree between it and the marvellously effective substances secreted by the various ductless glands? The brain is not a gland but it is an organ of such complexity and perfection that it is impossible to conceive a limit to its power.

There are two reasons that seem to everyone who has studied the problem, unanswerable. One is that it is impossible to explain anything as an effect unless we can regard it as strictly commensurate with the cause, and mind is not commensurate with cerebral process. And the second is that the consciousness which arises in connection with cerebral process is not consciousness of cerebral process but of something which is altogether independent of cerebral process, something existing in a different space, it may be thousands or millions of miles away from the brain, and something existing at a different time, it may be ages before or even after the present moment at which the cerebral process takes place.

Let us examine each of these reasons carefully. And first the reason why the form of explanation we call cause and effect and which is the form of all ordinary and scientific explanation will not explain the production of the mind from the physiological processes in the brain. There is no need to discuss any of the philosophical problems involved in the idea of causality, the question is simply one of fact. Is the relation of the mind to the brain one of those relations that can be explained as cause and effect? When excessive light falls on the retina there follows immediately a contraction of the pupils and, if that is not sufficient relief, then a closing of the eyelids. We can analyze this fact into a series of events each mechanically determined by the preceding one. If we start with the light we say that it communicates to the retina a molecular motion which is transmitted by the optic nerve to the brain, from the brain by efferent fibres to the muscles controlling the iris and eyelid which, by contracting or relaxing as the case may be, cause the iris to close the aperture admitting light, and the eyelid to cover and protect the whole

organ. We can pursue our investigation further—in fact in either direction to any extent that we please. We can explain the mechanism of the muscles and the supply to them of their energy, the anatomy of the retina and of the nerve fibres and the nature of their function, or on the other side we may explain the excessive light as due to the solar rays and these as produced by the rapid movement of the molecules in the solar mass. We call all this explanation because we can translate every fact we deal with into a common term and state its exact equivalence (theoretically of course) in that common term. The common term is movement. If throughout the whole series there is anything that cannot be resolved into movement then that thing is not in the causal relation. Now suppose that while this event is happening I am conscious. I shall be aware of a painful sensation, aware of the light as a perception, aware of the sun as the object of perception, aware of the immense velocity of the movement of the molecules of its mass and the consequent propagation of waves of light as my conception of the nature of light, aware also of the response my muscles are making to the stimuli my sense organs are receiving as my effort or conation. This awareness forms a connected series but it is not, like the physiological process, a series of movements, and it does not intervene in that series, it does not form a link in the chain of transformations of movement that I call causes and effects. The two series are quite independent as series, and the physiological process I explain by the relation of cause and effect because I find in every state the exact equivalent measured in movement of the preceding state, but the psychical series I explain by association which does not include the idea of equivalence or of measurement. But the important point is this, that the whole of this awareness with all the association that constitutes it a connected series, comes into existence at one precise moment of the physiological process and at no other. This moment is when the stimulus from the sense organs reaches the cerebral cortex. Therefore it seems that the awareness must be produced at that moment by the process, and yet it is impossible that it can be, because it is not equivalent to the energy

received by the cortical cells at that moment, it does not change the form of that energy or intercept it or in any way affect the series, that is to say, not in any way that the physiologist can take into account. The physiological process is complete in itself and explained as a series of exactly equivalent causes and effects independently of the awareness that arises at one of its moments.

Let us now look at the second reason, which rests on the nature of what we may call the content of consciousness, meaning the reality of which we are aware in consciousness. Our body is a part of the universe and like the rest of the universe an external object to the mind. Awareness is occasioned by the various influences which affect the surface of our body. Every one of the things we are aware of, supposing of course that there are realities outside of us and that we are aware of them, is outside of the process that is going on in the brain. Even if we include this process as itself part of the universe we are aware of it not immediately in its functioning, but reflectively in explaining to ourselves the function of the brain as an object independent of our consciousness of it. Whatever therefore the nature is of the processes that are going on in the cells and fibres of the cerebral cortex, it is impossible that we should be aware of a real world outside of the brain and also that that awareness should be produced or manufactured in the brain. If we really could believe that our mind was produced in and by our brain, that the brain cells manufactured it or constructed it out of movements sent to it from the skin and sense organs, we could have no assurance that we had any knowledge of reality or that there was any reality to know. We might of course suppose, as some philosophers in former times supposed, that God performs a miracle every time we know anything, and that our only guarantee that there is any world independent of our knowledge, or that our knowledge is of a real world, is our faith in God that He does not deceive us. But considered simply in itself and according to the rules we apply to all our deductions and inferences, if the mind is simply a product of the brain it is then something potentially present in the brain or present in the

materials supplied to the brain before it is actually produced, and this something cannot be what is happening outside the brain or that did or will happen outside the brain. It is not the process going on in our brain that we are aware of, but the process going on outside our brain, and although influences reach our brain from outside and although the physiological processes are directly connected with the outside world by the sense organs, yet these influences are stimuli which cannot be conceived as translating anything, even images of things, into the brain as a material out of which the brain might be conceived to produce the mind.

These two reasons are as I have said unanswerable. The first may be summed up in saying that the chain of causes and effects in the physiological process of which the brain is the centre is complete without the intervention of the psychical process, while the psychical process of consciousness, though a connected series, is not a relation of effects to causes but of association of ideas which involves no conversion of energy. And the second may be summed up in saying that knowledge, if it is knowledge of what is outside the brain, cannot be manufactured inside the brain. It is admitted therefore practically by everyone that consciousness is not an effect of process in the cerebral cortex in the same way that the responsive movement of the muscles is such an effect. The brain directly connects the response of the body to the stimulus received but the consciousness that arises in the process is not part of the efficiency. Yet this consciousness is certainly not independent of the process, for if it is why does it arise at one moment and at one moment only of the process? So it has been suggested that it may be an effect of a different kind, an effect that does not absorb energy or give out energy, but still a direct effect of the cerebral process. It is said to be an epiphenomenon, and is compared to the shadow that accompanies a moving body which neither aids nor hinders it though invariably accompanying it, or to the phosphorescence left along the track of the lucifer match we have struck, a one sided effect that cannot in its turn become a cause.

This theory is widely held and is considered by most of those

who support the materialist, or what is now more generally called the mechanistic, view, to meet all the difficulties that are involved in the conception of the mind as an effect or product of processes in the body. We may grant at once that so far as the first difficulty we have noticed is concerned, the conception of the mind as an epiphenomenon of the brain is a possible one. It may be that there are after effects of brain processes which though the direct effect of physical movements and of the conversion of energy, are yet not themselves an absorption of energy and do not therefore become an actual calculable part of the causal chain. We could explain in this way why consciousness is not measureable in terms of physical movement, although a product of physical movement. Moreover, so far as consciousness is simple feeling, pleasure and pain, something without distinguishable content and purely an affection, the conception might suffice. But when we consider the real nature and content of consciousness,—the second of our difficulties—the conception becomes impossible to the point of absolute incredibility. Think what this phosphorescence must be and do! It springs up along the track of a wave or current passing through the centres and fibres of the cerebral cortex and when it springs up we are conscious—of what? Of the passing nerve current? No. Of the fact that it has passed? No. Of the stimuli that originated it on the surface of the body? No. Of the direction towards the muscles which are to be set in movement? No. We are not aware of any of these things that actually are occurring but of the world outside us, of the world outside the nerve current altogether, of other persons and of other things than the body and its processes, of things like stars infinitely distant in space, of recollections, of thoughts of things that may have happened at a time infinitely remote from the moment when the passing current, which occupies a limited portion of space and occurs at a definite moment of time, gives forth its luminous trail.

This is the rock on which all these theories that derive mind from body split. We wish to derive a reality that is unconfined in space and unlimited in time from a reality that is limited to a definite portion of space and to a moment of time. Suppose we

succeed, we are then in this extraordinary dilemma that the only actual fact is the brain process with its consequence, and therefore the reality we are aware of may be a pure illusion, for the fact cannot guarantee its independent existence, and yet at the same time our only knowledge that there is a brain process with this consequence is an inference from the reality we falsely suppose ourselves to know. The argument therefore is a vicious circle. How do we know that there is a world outside of our body of which the body is a part? Because a certain process has taken place in a certain portion of our brain. And how do we know that this process has taken place? Because we know that there is a world outside of our body of which the body is a part. Everyone has heard the story that used to be told in derision of the Hegelian philosophy, of the German philosopher who preparatory to writing an essay on 'The Camel' went into his study to evolve the animal out of his self-consciousness. The story used to end with the unnecessary information that he is there still. Not more impossibly absurd is the idea that our mind is a product, whether we call it epiphenomenon or whether we think of it as a substantial effect, of our brain.

There are other theories besides that of the epiphenomenon which have been proposed as an explanation of the necessary connection of mind and body, but they come to grief on the same rock. There is the very attractive theory of double aspects, very attractive because it offers a direct solution of the apparent dualism, according to which there is only one fact, but it assumes two aspects, a psychical aspect as consciousness, a physical aspect as movement or brain process, just as the movement we see from the shore as the ship tossing on the rolling billows is the same movement which in the ship's cabin is felt as conscious experience. Then there is the mind-stuff theory, according to which there is a substance of which every mind is composed which is as universal as material substance, a stuff of which every molecule, atom and electron has its share. I need not go into these theories in detail because it must be obvious that they will be confronted with the very same difficulty that we have been examining, the difficulty of the nature of mind

and consciousness, that it is awareness of reality not confined to, nor commensurate with, the physical process which accompanies it.

The difficulty is so great that most psychologists and philosophers seek a way of escape, and so they adopt a theory which seems to them to recognize the fact of necessary connection without committing them to any theory as to its nature. This is the well known hypothesis of psycho-physical parallelism. It is a very old theory that was formulated in the 17th century. Leibniz illustrated it by supposing that a clever artificer had designed two clocks whose movement and appearance might differ, but each of which kept perfect time; they would always synchronise and by reading one clock you might always know the exact condition of the other. So he supposed that God at the Creation had made the mind and the body as two clocks which always kept time and therefore seemed as though the state of one was simply dependent on the state of the other. Now it seems to me that everyone who adopts this hypothesis, whatever be the form he gives it, neglects two very important facts. The first is that the hypothesis goes far beyond anything that is justified by experience, it is much more than a mere admission of facts. Experience tells us that a physical process always accompanies a psychical process, but parallelism tells us that there is a one-one relation between the physical fact and the psychical fact. If it does not imply this, it is not parallelism but merely a fact which no one denies, that there is a constant relation between the psychical and the physical. And the second is this, that so far from its being a non-committal hypothesis it is the distinct adoption of a metaphysical theory.

The difficulties of every form of psycho-physical parallelism have been lately very generally recognized; they are admirably set forth in the new edition (1913) of Dr. Stout's Manual of Psychology, and there has in consequence been an attempt to restate the doctrine of interaction in a form that will not conflict with the scientific law of the conservation of energy. Interaction supposes that the mind actually supplies energy to the body and that psychical reality undergoes conversion into physical

reality. It is clear therefore that it is the first, rather than the second of the two difficulties we have stated, that is the real stumbling block to this theory. To overcome it the hypothesis has been suggested that there may be in every case of conscious action a conversion of energy that exactly compensates itself—a simultaneous conversion of psychical into physical energy and of physical into psychical energy, so that the amount of each remains always constant. If this is the last word of interactionism then it seems to me to offer us only a choice of evils. It is possible, in the sense that it avoids the actual absurdity of parallelism, but like parallelism it is a metaphysical theory that goes far beyond any known facts of experience and that throws no light whatever on the facts.

The fact which we have to recognize, and which there seems to be a natural disinclination in the human mind to recognize, is that mind and brain are absolutely incommensurable. They are two realities which meet—that is certain for we never have one without the other—but they meet like the circle and the tangent at one point only. What constitutes this difference and why is the incommensurability absolute? The brain is material and therefore spatial, it is a certain disposition of material elements. This disposition of elements changes but only externally by influences that affect the disposition, but not the elements themselves. It is a delicate organization easily thrown out of balance or destroyed, but what is essential to its existence is material organization. On the other hand, mind is not spatial but temporal, its essential nature is a duration which conserves the past in memory. Imagine that an instantaneous cut is made across the whole of extension. The brain is there but not the mind, for you are imagining extension without duration and mind has no extension. Imagine on the other hand a section through the whole of duration, the mind is there but not the brain, for matter only exists simultaneously in a present, you cannot imagine matter without extension. The mind is therefore essentially a time continuity and the brain essentially a space continuity. Restrict the mind to the actual condition of the brain at any given moment and there is no

mind. Cut off from immediate perception all memory and imagination and there is no perception. Theoretically all that there is to perceive in the present is there, but without memory and imagination it can have none of the content or meaning that mind gives to it. On the other hand, the brain can have neither memory nor imagination, for all that it is, it is at every moment. In this lies the true reason why we cannot think that brain produces mind, it would be imagining that space produces time. It would mean that a present activity produces its own past and future. Nor can we escape the absurdity by supposing that the brain does not create the memory but preserves past impressions and ideas in nerve cells or nerve tracks and sets them free or revives them in response to stimuli. It would be easy to show that the same contradiction we have been examining before follows us here, but it is enough to say that such a theory can adduce no facts in its support. There are, however, many facts which seem to contradict it. One of these facts is very remarkable, and of especial interest, because it forms the basis of the theory of memory expounded by Bergson in *Matter and Memory*. It is the discovery some years ago, confirmed by every case since observed, of the nature of the malady known as auditory aphasia, a malady in which the patient, while still retaining the sense of hearing, has lost the power of recognizing the meaning of words. He seems to have lost his memory, to have forgotten what words mean, without having lost the power of recognizing the things themselves. This malady is accompanied by a lesion of a particular region of the brain, one of the frontal convolutions well known and mapped out by anatomists. The discovery was the first, and also it remains the only successful, localization in the brain of a particular form of memory, that which we call recognition of words. It seemed at first to confirm the generally held opinion that there are special cells in the brain whose function is to store memories, and it was supposed therefore that the injury involved the destruction of a group of cells in which a particular kind of memories was stored, with the consequent result that the memories were destroyed, and that therefore according to the extent of the lesion was the amount

of irrecoverable loss of memory. Bergson was the first to show that the facts pointed to an entirely opposite conclusion, that the memory was still in existence and unimpaired, but that what was thrown out of gear by the injury was the mechanism by which memory inserted itself in action. It was not a psychical reality but a motor mechanism that was affected. This view is now adopted by many of the most prominent psycho-physiologists, but even those who do not accept it no longer quote aphasia as proving that psychical reality is produced by or stored up in material structures.

If we recognize this fact that in mind and brain we have two realities that are incommensurable by their very nature, but which function only in union with one another, we may understand why everything happens just as if the one were produced by the other. Why it is that when the Titan cleaves the head of Zeus the fully armed Athene springs into existence. To understand it we must see what it is that consciousness does, the purpose it fulfils. What we call consciousness is not the whole of mind. If it were, if part of mind were not always something of which we are unconscious in exactly the same sense that the material reality we perceive is always a part of a reality we are not perceiving, then the arising of consciousness at a particular juncture would be as inexplicable a miracle as that of the sudden existence of the fully armed goddess. The union of mind and body is in action. When we regard the facts from the standpoint of action, all difficulty in regard to them disappears. We can see the part the brain plays and the part the mind plays as clearly as we can see the part the senses play and the part the muscles play. First of all we see why there must be union, because without the body, the mind, whatever it is, whether or not it is a separate as well as a distinct existence, can do nothing. The body is the instrument of the mind's activity. And without the mind the body is the blind play of physical forces. Take them in their union and we see at once what the brain is—a great exchange office or switchboard, where the stimuli that come from the outer world are received and switched on to their responsive movements. We see also

what the mind is, it is the whole scheme of our activity, and we see how it functions by bringing the field of our activity to consciousness. The stimuli received become affections and are perceived, and memories give meaning to perceptions, and delineate prospective actions and so direct the response. It is therefore at this point, when the stimuli from the senses reach the cerebral cortex and before they issue in actions, that consciousness functions. If it is to serve action it is only there that its service can be effective. Naturally therefore it seems as if it is the functioning of the brain at this point that produces the mind.

This then is the answer we give to the question why it is that the mind seems to be, and yet cannot be, produced by the brain. The mind guides and controls what the body does, it directs the body's actions. There is only one point at which control of action can be effective, and that is where the responsive movement of the body to a stimulus received is initiated, that is in the cerebral cortex. Because the mind is acting there it seems to come into existence there. That is our reason for saying that everything must happen just as if the mind was produced by the brain. But the mind is a reality of an entirely different order to that which alone can be produced by physical movement or by the material disposition of such things as atoms and molecules. That is our first reason for saying the mind cannot be produced by the brain. The brain is a certain group of material particles, or a certain equilibrium of physical forces, occupying a definite position in space, which responds to movements by transmitting movements. The mind is a continuity of time, a duration, a perceiving of what is outside the body, a remembering of what is over and past, an imagining of what is not yet. None of these characters are spatial. That is our second reason for saying that the mind cannot be produced by the brain.

H. WILDON CARR.

LONDON.

ROGER BACON AND EXPERIMENTAL METHOD IN THE MIDDLE AGES.

THE year 1914 marks approximately the seventh centennial of the birth of Roger Bacon, and offers opportunity for a reconsideration of his place in thirteenth century thought and of his relation to modern science. Two hundred years ago, before Jebb had edited the *Opus Maius* in 1733, Roger Bacon was unappreciated and unknown. Today many will incline to celebrate his anniversary as that of the first rebel against mediæval scholasticism and the first prophet of modern science. They may feel that such recognition is the more due to his memory because they believe him to have been a prophet without honor and persecuted in his own age, or because they believe that in later times Francis Bacon received the praise that was Roger's due. They will set Roger's four causes of human error against Francis's idols; they will point to Roger's urging the study of Greek, Arabic, and Hebrew as well as Latin, and to his sharp criticism of the translations of Aristotle in vogue in his day, to his investigations in optics, to his insistence upon the importance of the mathematical method, whose value Francis scarcely realized; but above all they will remember Roger's criticism of scholastic methods, of reliance on authority, and his advocacy of experimental method. It is of this last point, long regarded as the brightest gem in Roger's crown, that the present article will treat, inquiring what Bacon's discussion of 'experimental science' really amounts to, whether his conception was a novel one or the common property of his age, and finally what the actual status of experimentation was at that time.

But before attacking this particular problem it will be well to give some idea of recent study of Bacon and the progress of opinion concerning him, especially since doing this will pave the way for our argument. Much attention has been given to Bacon since the editing in 1859 by Brewer of a number of his writings

hitherto unpublished,[1] and the almost simultaneous appearance in 1861 of Émile Charles's *Roger Bacon; sa vie, ses ouvrages, ses doctrines*. Unfortunately Charles wrote without knowledge of Brewer's labors, and it must be added that several writers on Bacon since have failed to keep abreast with the latest research in their field. These works by Brewer and Charles educed a number of minor essays and studies in the following decades.[2] Then a new impetus to the study of Bacon was given in 1897 when the *Opus Maius*, previously accessible only in Jebb's rare and incomplete edition, was re-edited by Bridges.[3] In the same year Father Gasquet published a new fragment which he regarded as an introduction to the *Opus Maius*.[4] In 1902 Nolan and Hirsch edited Bacon's Greek Grammar. Then in 1909 Professor Duhem gave to the world a newly discovered fragment of the *Opus Tertium:* in 1911 the British Society of Franciscan Studies printed the *Compendium Studii Theologiæ*, and, in 1912, more of the *Opus Tertium*.[5] Meanwhile Robert Steele, who in 1905 had edited a fragment of Bacon's Metaphysics, since 1912 has been producing the *Communia Naturalium*.

As Bacon's works have thus become more generally known and as standards of historical criticism have grown more strict, his life, doctrines, and point of view or personal equation have been more carefully examined and analyzed, and much legend and exaggeration have been exposed, although still repeated in some quarters. Indeed, the very writer who rejects some one legend may hold fast to the old view of Bacon in all other respects.

[1] Fr. Rogeri Bacon *Opera quaedam hactenus inedita*. Ed. J. S. Brewer, London, 1859; Vol. 15 of *Rerum Britannicarum medii aevi scriptores*, (published under the direction of the Master of the Rolls and usually spoken of as "The Rolls Series"). This work will hereafter be cited as *Brewer*.

[2] For bibliography of these and later works on Bacon see the article on Roger Bacon in the *Catholic Encyclopedia*, and "The Seventh Centenary of Roger Bacon (1214–1914)," by Fr. Paschal Robinson in *The Catholic University Bulletin*, Vol. xx, pp. 3–9 (Jan., 1914).

[3] The *Opus Maius* of Roger Bacon. Ed. J. H. Bridges, Vols. I and II, Oxford, 1897; Vol. III (correcting numerous errors in I and II), 1900. This work will be hereafter cited as *Bridges*.

[4] *English Historical Review*, XII, 494–517. This will be cited as *Gasquet*.

[5] *Part of the Opus tertium of Roger Bacon*. Ed. A. G. Little, Aberdeen, 1912. This will be cited as *Little*. It includes Duhem's fragment.

There is, therefore, the more reason for a brief collective review of this criticism which hitherto has been somewhat piecemeal and fragmentary.

For one thing, it is admitted by many that Bacon did not anticipate modern inventions by actual discoveries. As far back as 1864 *The Westminster Review* said: "It can easily be shown that of the things which Bacon is asserted to have invented, several were perfectly well known before his time, and the rest are nowhere described in his works."[6] He mentions spectacles and explosives but does not claim them as his own discoveries; he dreamed of future marvels of science but he worked none of them out in detail. Perhaps he thought that he could, but then, he thought that he could make gold artificially.

Secondly, Bacon cannot be proved a martyr to science, nor have we any evidence that his contemporaries hated him and that the church persecuted him for his scientific studies. On the contrary, his best works were produced at the command of the pope,[7] and one of their chief aims is to induce the church to enlist science in its service and to profit by scientific discoveries. Abbé Feret has shown how through the nineteenth century successive historians, including even Charles, kept adding to the story of Bacon's persecution by the Franciscans, without giving any references to the sources for details which they elaborated from their imaginations.[8] The legend that he was imprisoned from 1257 to 1267 rests simply on unwarranted inference from his own statements to the pope,[9]—statements which really only show that in recent years he has not won the fame which he thinks his due, that he is jealous of his more successful contemporaries, and that he is desperately anxious to secure the

[6] Vol. 81, p. 247, in an article on "The Philosophy of Roger Bacon." At page 1 of the same volume begins an article on "The Life and Writings of Roger Bacon."

[7] For the pope's letter see *Brewer*, p. 1.

[8] P. Feret, "Les emprisonnements de Roger Bacon," *Revue des questions historiques*, Vol. 50, pp. 119–142. See also the *Catholic Encyclopedia;* whereas the last edition of the *Brittanica* preserves the old legends. For a *reductio ad absurdum* of the legend-building note, A. Parrot, *Roger Bacon et ses contemporains*, Paris, 1894. Parrot also is ignorant of Brewer's edition and regrets that the *Opus tertium* is still unprinted (p. 51).

[9] Contained mainly in the first twenty chapters of the *Opus tertium*.

pope as his patron. However, an Assisi manuscript of the early fourteenth century states that in 1277, a decade after his writings to the pope, a council of his Order condemned "the doctrine of Rogerius Bacho, an English master of sacred theology, since it contained some suspected novelties, on account of which the said Roger was condemned to prison."[10] But what the novelties were we are not informed; they were probably theological rather than scientific. Some writers have assumed that they were astrological, but there was nothing 'novel' about Bacon's astrology.[11] Theories that Bacon was accused of magic are also unwarrantable inferences from his own statements. He complains that the Canon Law confuses mathematics and magic, and that philosophers are sometimes falsely accused of magic; it is thereupon assumed that what he says may happen to others did happen to himself.

In the third place, Bacon's outspoken criticism of the learning of his age is no longer unquestioningly accepted. A review in the *English Historical Review* for October 1912, "hopes that it is not an article of faith with the Society of Franciscan Studies to accept all of Roger Bacon's statements. As regards the state of knowledge among his contemporaries, his assertions are often of no greater value than the similar assertions of his distinguished namesake in a later age."[12] It is seen that his tendency to indulge in personalities and to belittle his distinguished contemporaries must be discounted. When he sneers at meritorious scholars like Albertus Magnus and William of Meerbeke,[13] one wonders how far to accept his hostile estimate of the schools at Paris, his boasts of his own superior knowledge and better methods of teaching, his professed exploitation of neglected fields in linguistics, mathematics, optics, alchemy, and experi-

[10] *Bridges*, III, 158.

[11] P. Mandonnet, "Roger Bacon et le 'Speculum astronomiæ,'" *Revue Néo-Scolastique*, Vol. 17 (Aug., 1910), tries to prove that Bacon and not Albertus Magnus wrote the *Speculum*, that it was written in 1277, and that he was condemned on account of it; but I see many reasons (which I hope to set forth in print soon) for hesitating to accept his conclusions. Mandonnet's method of historical inference in another connection has been satirized by Ch. v. Langlois in the *Revue de Paris* for Sept. 1, 1900.

[12] "W. H. V. R." on p. 810.

[13] *Opus tertium*, Cap. 2, and *Compendium studii*, Cap. 8 (*Brewer*, p. 14 and 472).

mental science. His censure of the translations of Aristotle in use at Paris loses much of its force, when we learn that he himself bases some of his views upon mistranslated passages from Aristotle,—passages which Albert and Aquinas translate as well or better than he.[14] Also we must remember that Bacon is addressing the pope and trying to interest him not only in the reform and advancement of learning but in Roger Bacon. So if, as Macaulay said, Francis Bacon seeking the truth was a very different person from Francis Bacon seeking the seals, we must remember that Roger combines both attempts at once.

Fourthly, the faults of Bacon's own learning, his superstition and credulity, his belief in alchemy and astrology, have been noticed, so that a recent reviewer speaks of "the usual Baconian atmosphere, in which science and superstition are happily or unhappily compounded."[15] These weaknesses are usually charged in large measure and correctly to the age in which Bacon lived; but, while some treat them as only throwing his merits into higher relief, these failings at least support Hastings Rashdall's assertion that "Bacon was more the child of his age than he imagined himself to be,"[16] and perhaps may be taken as an indication that his virtues, too, were those of his age.

Father Mandonnet, the erudite author of *Siger de Brabant et l'averroïsme latin au XIIIe siècle*, thinks that Bacon's importance has in many ways been over-estimated.[17] While Charles held that, if Bacon's scientific importance had been exaggerated, his value as a schoolman had been lost sight of, Mandonnet affirms that as a philosopher and theologian, Bacon was behind rather than in the forefront of his age. Bacon has been reproached for making philosophy and science ancillary to theology,[18] but he

[14] K. Werner, "Die Kosmologie und allgemeine Naturlehre des Roger Baco," *Sitzungsberichte d. ph.-hist. cl. etc.*, Wien, 1879, Band 94, p. 495.

[15] "W. H. V. R." in *English Historical Review*, Vol. 28, p. 805 (Oct., 1913).

[16] *Fratris Rogeri Bacon Compendium Studii Theologiæ*. Ed. H. Rashdall, Aberdeen, 1911, p. 3.

[17] Mandonnet, *Siger de Brabant*, Deuxième édition, 1908–1910, Vol. I, pp. 40, 244–8.

[18] See *Gasquet*, 509. Nam sum certus quod solum illud de philosophia est utile et dignum quod sapientia sacra dignatur, sicut ab ancilla, requirere; totum enim residuum stultum est et insanum. See also H. O. Taylor, *The Mediæval Mind*, II, 486.

could scarcely do otherwise when addressing the pope and trying to induce the church to support science.

This changing tide of opinion concerning Bacon's life and works both suggests that there may be room for further revision of our estimate of him, and provides a more correct setting for his discussion of experimental science. But to evaluate this properly we must rid ourselves of one more false assumption, namely, that mediæval learning was exclusively scholastic and theological, and that Bacon in his advocacy of natural science was "a voice crying in the wilderness." This notion still survives in writers whose estimate of Bacon is otherwise sane and critical. Thus the articles in *The Westminster Review*, quoted above against the attribution of modern inventions to Bacon, and which further state that the merit of the *Opus Maius* "lies rather in the spirit in which it was written than in the facts it records or in any merit which it may have as a scientific whole," go on to say that "Bacon preached a philosophy of which not half-a-dozen men in Europe saw the value, and of which the majority of really good men feared the results," and that "when Roger Bacon was laid in his grave the real philosophy was buried with him."[19] Such is still the impression given by otherwise excellent recent estimates of Bacon, such as those in the *Catholic Encyclopedia* and in Henry Osborn Taylor's *The Mediæval Mind*.[20]

But such an assumption is ungrounded. Most educated persons are, it is to be hoped, by this time aware that the middle ages were not 'dark ages,' that the classical revival of the 15th and 16th centuries was no new birth of civilization, and that our modern states, literatures, laws, cities, and universities had begun by the twelfth century. It should equally be realized that the rise of modern science can no more be associated with

[19] *Westminster Review*, Vol. 81, pp. 12, 9, and 252.

[20] Taylor's discussion of Bacon occurs in Vol. II, pp. 483–508. He goes farther than the sources justify in some of his assertions concerning Bacon's life, though he is caution itself compared to some writers. For instance, it cannot be shown that before 1266 Roger's pursuit of learning "had been obstructed by the Order of which he was an unhappy and rebellious member"; nor that "he had evidently been forbidden to write, or spread his ideas; he had been disciplined at times with a diet of bread and water."

the so-called Renaissance than with the so-called Middle Ages. The scientific interests and the characteristics of works on nature in those two periods were very similar. Of course there was progress, but there was no break, they merge into each other. Galileo's telescope was the natural outgrowth of earlier investigations concerning lenses which had resulted in the use of spectacles as early as the thirteenth century. Printers of the 15th and 16th centuries found plenty of readers for the many mediæval works on nature which they published and which often ran through several editions. The narrow humanist had no more interest in natural science than the narrow schoolman. In the middle ages logic and discussion were not the only forms of intellectual exercise, though they largely displaced the rhetoric and oratory of Roman days. The collection of facts was another engrossing pursuit, as the voluminous mediæval encyclopedias testify; there was keen curiosity about the things of this world. Open a book for general reading in a vernacular language, the long French poem, *The Romance of the Rose*, and you will find there more allusions to natural science and to human history than to logic and theology. Perhaps in the early middle ages literature was almost exclusively ecclesiastical and based upon patristic authorities. But through the twelfth century the tide of secular and scientific learning was rising, until in the first part of the next century the University of Paris was powerless to prevent the study of the newly discovered books of Aristotle in natural philosophy. Aristotle, moreover, was far from being the sum and substance of mediæval science which drew from many other sources, such as Ptolemy, Pliny, Galen, and the Arabs, and which made original contributions and practical discoveries of its own. It was an age when even a superstitious book on magic and necromancy such as *Picatrix* declared that science was God's greatest gift to man, since "It always is making acquisitions and never diminishes; it ever elevates and never degenerates; it is always clear and never conceals itself."[21] And

[21] Lib. I, Cap. 1, of *Picatrix* as contained in Ms. XX, 20, National Library, Florence. Semper acquirit et numquam diminuit; semper elevat et numquam degenerat; semper apparet et numquam se abscondit. *Picatrix* was translated from Arabic into Spanish by order of Alfonso X. (1252–1284), and eventually was translated into Latin. There are two Mss. of it at Florence.

even Bacon asserts that many scientific facts and truths were now known of which Plato and Aristotle, Hippocrates and Galen had been ignorant.[22]

It would be exceeding the limits of this article to discuss further this mediæval interest in natural science, and there are already a number of books or papers dealing with that field, although undoubtedly a great deal remains to be done. Even the subject of experimentation in the middle ages has been approached, but never sufficiently discussed. Pouchet in his *Histoire des sciences naturelles au moyen âge, ou Albert le Grand et son époque considérés comme point de départ de l'école expérimentale*[23] was one of the first to point out Albertus Magnus's insistence on the necessity of experience as a criterion of truth in natural science, but his discussion goes little farther than that. Abbé Narbey's "Le moine Roger Bacon et le mouvement scientifique au XIIIe siècle"[24] is another promising title which leads to disappointment. Mr. Taylor gives a discriminating analysis and estimate of Bacon's discussion of experimental science, considered *per se*, but regards it as a unique contribution, calling it "this most original and 'advanced' product of Bacon's genius."[24a]

It has, however, been observed that there was much practical experimenting in Bacon's time among artisans and alchemists. Picavet writes on this point, "It is well known that the technical arts attained great perfection. What is less realized is that the thirteenth century marks an important epoch in the history of the experimental sciences, that Roger Bacon is not an isolated apparition or exception. There was a whole school of alchemists who performed the experiments mentioned by ancient writers and devised new ones."[25] But this article will not compare what Bacon said with what others did but only with what others said;

[22] *Brewer*, p. 542; *De secretis operibus artis et naturæ et de nullitate magiæ*, Cap. 7.

[23] Paris, 1853.

[24] *Revue des questions historiques*, Vol. 35 (1884), pp. 115–166. Narbey is still another Frenchman who shows no acquaintance with Brewer's edition.

[24a] H. O. Taylor, *The Mediæval Mind*, II, 500.

[25] F. Picavet, *Esquisse d'une histoire générale et comparée des philosophies médiévales*, Paris, 1905, p. 224. See, too, P. E. M. Berthelot, *La chimie au moyen âge*, 1893, 3 vols.

it will confine its attention to allusions to experimental method in the writings of Bacon and his contemporaries. Many of the latter are today comparatively inaccessible and unknown, since they exist only in rare old printed editions; and the admirers of Bacon who reproach previous centuries with their neglect of Roger's works are unconscious that they are similarly neglecting a considerable group of mediæval men of science.

We have first to examine Bacon's discussion of "experimental science" (*scientia experimentalis*), to which one section of his *Opus Maius* is devoted[26] and to which he adverts more briefly in other works. He regards it as the best criterion of truth in natural science. "All sciences except this either merely employ arguments to prove their conclusions, like the purely speculative sciences, or have universal and imperfect experiences;"[27] while "It alone, in truth, has the means of finding out to perfection what can be done by nature, what by the industry of art, what by fraud"; for it alone can distinguish what is true from what is false in "incantations, conjurations, invocations, deprecations, and sacrifices."[28]

But how is one to set about experimenting? On this point Bacon is disappointing. His explanation of the rainbow, which is his longest illustration of the value of experimental science, is based merely on ordinary intelligent observation and reasoning, although he adds at the close that tests with instruments are needed and that consequently he will not assert that he has reached the full truth of the matter.[29] Elsewhere he speaks of astronomical experiments "by instruments made for this purpose," but seems to regard the unaided eyesight as sufficient for the investigation of terrestrial phenomena. Bacon has sent "over sea and to various other lands and to annual fairs, in

[26] *Bridges*, II, 167–222; *Little*, 43–54.

[27] *Gasquet*, 510. . . . scientie omnes preter hanc vel utuntur argumentis tantum ad probationem conclusionum suarum, ut pure speculative scientie, vel habent experientias universales et imperfectas.

[28] *Bridges*, II, 172. Hæc ergo sola novit perfecte experiri quid potest fieri per naturam, quid per artis industriam, quid per fraudem, quid volunt et somniant carmina conjurationes invocationes deprecationes sacrificia. . . .

[29] *Ibid.*, II, 201.

order that I might see the things of nature with my own eyes."[30] "And those things which are not present in our locality we may know through other sages who have experienced them, just as Aristotle by authority of Alexander sent two thousand men to different regions to experience all things on the face of the earth, as Pliny testifies in his Natural History."[31] The one contemporary who most nearly fulfills Bacon's ideal of what an experimental scientist should be, does not spend his time merely in reading, attending lectures, and engaging in disputations, but "is ashamed to have some layman or old-wife or knight or rustic know facts of which he is ignorant"; hence he goes out into the world and observes the doings of common workingmen and even takes hints from the operations of witches, enchanters, and magicians.[32] Bacon even believes that valuable medicines can be discovered by observing what remedies various animals employ. It would seem that experimental method is in a low stage of its development, if it takes lessons from common human experience and from the actions of brutes. Bacon sufficiently indicates, however, that it does not consist merely of observation and casual experience, but includes purposive experimentation, and he often speaks of "experimenters." Undoubtedly he himself experimented. But the fact remains that he gives no directions concerning either the proper environment for experimenting or the proper conduct of experiments. Of laboratory equipment, of scientific instruments, of exact measurements, he has no more notion apparently than his contemporaries.

Bacon says far more of the marvelous results which he expects experimental science to achieve than he does of method. Some of his dreams have been brought true by modern mechanical inventions, but in the main marvelousness rather than practic-

[30] *Gasquet*, 502. Unde multotiens ego misi ultra mare et ad diversas alias regiones et ad nundinas sollemnes ut ipsas res naturales oculis viderem et probarem veritatem creature per visum. . . .

[31] *Bridges*, II, 169. Et quæ non sunt præsentia in locis in quibus sumus, scimus per alios sapientes qui experti sunt. Sicut Aristoteles auctoritate Alexandri misit duo millia hominum per diversa loca mundi ut experirentur omnia quæ sunt in superficie terræ, sicut Plinius testatur in Naturalibus.

[32] *Brewer*, 46–47. Immo verecundatur si aliquis laïcus, vel vetula, vel miles, vel rusticus de rure sciat quæ ipse ignorat.

ability characterizes the aims which he proposes for *scientia experimentalis*. Indeed, of the three ways in which he represents it as superior to all other sciences, while one is that it employs sure proofs rather than mere arguments, two are that by it life may be greatly lengthened, and that from it a better knowledge of the future may be gained than even from astrology.[33] Thus experimental method is especially connected with alchemy and astrology. Bacon declares that "it has been proved by certain experiments" that life can be greatly prolonged "by secret experiences,"[34] and he believes that Artephius was enabled by such methods to live for a thousand and twenty five years.[35]

Some of his 'experiments' are as fantastic as the aims are marvelous. "A good experimenter says in the book *De regimine senum*" that the following elixir will greatly prolong life: "that which is temperate in the fourth degree, and what swims in the sea, and what grows in the air, and what is cast up by the sea, and plant of India, and what is found in the entrails of an animal of long life, and those two serpents which are the food of the inhabitants of Tyre and Aethiopia."[36] We also are told that "at Paris recently there was a sage who asked for snakes and was given one and cut it into small sections except that the skin of its belly on which it crawled remained intact; and that snake crawled as best it could to a certain herb by touching which it was instantly made whole. And the experimenter collected a herb of wonderful virtue."[37]

Credulity, in contrast to the skeptical attitude of modern

[33] *Gasquet*, 510; and *Bridges*, passim.

[34] *Bridges*, II, 205. Præterea certis experimentis probatum est, quod ista festinatio nimia est retardata pluries, et longævitas prolongata per multos annos per experientias secretas.

[35] *Ibid.*, 212.

[36] *Ibid.*, 210. Et ideo dicit experimentator bonus in libro de Regimine Senum, quod si illus quod est in quarto gradu temperatum, et quod natat in mari, et quod vegetatur in ære, et quod a mari projicitur, et planta Indiæ, et quod est in visceribus animalis longæ vitæ, et duo serpentes quæ sunt esca Tyrorum et Æthiopum, ...

[37] *Ibid.*, 208. Nam Parisius nuper fuit unus sapiens, qui serpentes quæsivit et unum accepit et scidit eum in parva frusta, nisi quod pellis ventris, super quam reperet, remansit integra, et iste serpens repebat ut poterat ad herbam quandam, cuius tactu statim sanabatur. Et experimentator collegit herbam admirandæ virtutis.

science, is a characteristic of Bacon's experimental method. He declares it true that experiment disproves many false notions, but he also asserts that credulity is necessary in experimentation. "First one should be credulous until experience follows second and reason comes third. . . . At first one should believe those who have made experiments or who have faithful testimony from others who have done so, nor should one reject the truth because he is ignorant of it and because he has no argument for it."[38] Taken as a plea for an open minded attitude toward scientific investigation on the part of the ordinary man and of the ecclesiastical authorities, this utterance may be commended; but as a prescription for the scientific investigator it is dangerous. Many of Bacon's 'experiments' are copied from books, and the reproach made against the Greek Empirics that they followed tradition, applies also to him. Describing a certain marvel of nature, he exclaims, "After I beheld this, there was nothing difficult for my mind to believe, provided it had a reliable author."[39] In the midst of his discussion of experimental science we encounter the following instance of his gullibility.

"It is certain that Æthiopian sages have come into Italy, Spain, France, England, and those Christian lands where there are good flying dragons; and, by an occult art that they possess, excite the dragons from their caves. And they have saddles and bridles ready, and they ride the dragons, and drive them at top speed through the air, in order to soften the rigidity and toughness of their flesh, just as boars, bears, and bulls are hunted with dogs and beaten with many blows before they are killed for eating. And when they have tamed the dragons in this way, they have an art of preparing their flesh . . . , which they employ against the accidents of age and prolong life and inspire the intellect beyond all estimation. For no education which man can give will bestow such wisdom as does the eating of their flesh, as we

[38] *Bridges*, 202. Unde oportet primo credulitatem fieri, donec secundo sequitur experientia, ut tertio ratio comitetur. . . . Et ideo in principio debet credere his qui experti sunt, vel qui ab expertis fideliter habuerunt, nec debet reprobare veritatem propter hoc, quod eam ignorat, et quia ad eam non habet argumentum.

[39] *Ibid.*, 219. Postquam enim hoc intuitus sum, nihil fuit meo intellectui difficile ad credendum, dummodo habuit auctorem certum.

have learned without deceit or doubt from men of proved trustworthiness."[40]

Bacon's discussion of experimental science, therefore, on its positive side amounts to little more than a recognition of experience as a criterion of truth and a promulgation of the phrase 'experimental science.'[40a] Let us now look at other writers. Bacon himself, by his copying 'experiments' from other books and by his locating an 'experimenter' even at degenerate scholastic Paris, has suggested that we may find the subject treated elsewhere. We shall not find, it is true, any such express and lengthy discussion of the matter as his, but we may get the same substance in briefer form from the fairly numerous incidental references to experience and experiment.

As for experience as a criterion of truth, as early as the twelfth century we find writers on nature either asserting this or implying it. Early in that century Adelard of Bath in his *Natural Ques-*

[40] *Ibid.*, 211. Nam certum est quod Æthiopes sapientes venerunt in Italiam et Hispaniam et Franciam et Angliam, et in istas terras Christianorum in quibus sunt dracones boni volantes, et per artem occultam quam habent excitant dracones de cavernis suis, et habent sellas et frœna in promptu, et equitant super eos et agitant in ære volatu fortissimo, ut dometur rigiditas carnium et temperetur durities, sicut apri et ursi et tauri agitantur canibus et variis percussionibus flagellantur, antequam occidantur pro comestione. Cum ergo sic domesticaverint eos, habent artem præparandi carnes eorum, . . . et utuntur eis contra accidentia senectutis, et vitam prolongant et intellectum subtiliant ultra omnem æstimationem. Nam nulla doctrina quæ per hominem fieri potest tantam sapientiam inducere valet sicut esus istarum carnium, secundum quod per homines probatæ fidei didicimus sine mendacio et dubitatione.

[40a] The weak points in Bacon's discussion of experimental science have not hitherto passed wholly unnoticed. Mr. Taylor grants that "even his discussion of experimental science has touches of mediævalism which are peculiarly dissonant in this most original and 'advanced' product of Bacon's genius"; wonders "where the *experimentator* ever observed an eagle or a phœnix renewing its youth, outside of the *Physiologus*?"; and recognizes "how loose must have been the practise or the dreams of his 'experimental science,'" and that "he repeats himself continually in stating its properties and prerogatives, yet without advancing to greater clearness of conception." "His fundamental conception seems to waver: *scientia experimentalis*, is it a science, or is it a means and method universally applicable to all scientific investigation?" (*The Mediæval Mind*, II, 500, 502, 504, 506). And the *Westminster Review* says, "Notwithstanding his forcible language about the prerogatives of experimental science and his bitter invective against frail authority, we find him occasionally resting on authority with childlike faith, and treating his favorite science as if its only prerogative was to provoke a smile." The *Review* then cites some of Roger's absurd 'experiments.' (Vol. 81, p. 241.)

tions attacked exclusive trust in authorities, and, while relying especially upon reason, also adduced experience.[41] Alexander Neckam (1157–1217), who in 1213 was elected Abbot of Cirencester, in his *De naturis rerum* calls upon "diligent investigators of nature" to testify to the virtues of words, herbs, and stones, which have been demonstrated "by most certain experience."[42] Michael Scot, writing early in the thirteenth century, often uses the word *experimentum* in his elaborate introduction to astrology.[43] So does Vincent of Beauvais later in the century in his huge work on nature, the *Speculum naturale*.[44] The *Thesaurus pauperum* of Peter of Spain, who seems to have become Pope John XXI (died 1277), is further described in its title as, "Or concerning the ills of the human body by experiments ingenious, simple, and particular; an empirical book, from all sorts of authors and my own experience."[45] The scholastic form of the celebrated *Conciliator* of Peter of Abano, composed about 1300 and one of the most elaborate of mediæval medical treatises, makes one scarcely anticipate mention of experience or experiment. Yet Peter couples reason and experience as of equal authority, disagrees with those who deny that medicine is a science because it employs experience as well as reason, and in other passages alludes to his personal astronomical observations and his own successful experimenting with an incantation and an astronomical image.[46]

[41] Adelardus Bathoniensis, *Quæstiones naturales perdifficiles*, Louvain, 1480, Caps. 16 and 18. The British Museum has two copies of this edition (48 leaves and 30 lines to a page), and one copy of an edition with 43 leaves and 32 lines to the page.

[42] Alexander Neckam, *De naturis rerum*, II, 85, in Vol. 34 of the Rolls Series. Neckam's editor, Thomas Wright, declared that "he not infrequently displays a taste for experimental knowledge."

[43] Michael Scot's *Liber Introductorius* exists in manuscripts at Oxford (Bodleian 266) and at Munich (*Cod. Lat.* 10268).

[44] Vincentius Bellovacensis, *Speculum naturale*, Nurembergæ, Anth. Koburger, 2 folio vols. I found this work at the library of the Union Theological Seminary, New York.

[45] Petrus Hispanus, *Thesaurus pauperum*, seu de medendi humani corporis morbis per experimenta euporista simplicia et particularia; liber empiricus ex omni genere auctorum et experientia propria, Frankfurt, 1578. This and most of the medical works which follow I consulted at the John Crerar Library, Chicago. Peter was really born in Lisbon (*Histoire Littéraire de la France*, Vol. XIX, 322 ff.).

[46] Pietro d'Abano, *Conciliator differentiatum philosophorum et medicorum*, Venice, 1526. Diffs. III, IX, CXIII, and X; or fols. 5, 14, 154, 16 and 15.

A favorite theory in the twelfth and thirteenth centuries is that the things of nature possess 'occult virtues' which cannot be reasoned out but must be learned experimentally. The hypothesis was still in force[47] that all natural objects were composed of only four elements, earth, air, fire, and water, and characterized by four qualities, hot, cold, dry, and moist. It was impossible even by the most ingenious reasoning to explain on this basis certain properties of objects, such as the action of the magnet. So men decided that things possessed occult virtues in addition to the qualities which they derived from their component elements. Many believed that these occult properties were due to the influences of the stars; but in any case all agree that they can only be discovered by experience. General principles and logic give no clue to them. Peter of Abano writes, "We perceive that precious stones and medicines have marvellous and occult virtues which cannot come from the qualities and natures of the elements. . . . Effects of this sort cannot be investigated by reasoning based on the qualities of the elements, but rather by experience."[48] In the same strain write Arnald of Villanova,[49] a medical author who died in 1312, Thomas Aquinas,[50] Albertus Magnus, [51] and others.

Indeed, writers on Albertus Magnus have not failed to notice that his scientific writings are neither mere commentaries upon Aristotle, nor compilations from a variety of sources; but that he both recognizes experience as a criterion of truth, and frequently states the results of his personal observations. This

[47] It of course came down from the classical period.

[48] *Conciliator*, Diff. LX, fol. 83. Conspicimus etiam lapides preciosos et medicinas virtutes mirabiles et occultas habere que ex qualitatibus et naturis non possunt consurgere elementorum. . . . Huiusmodi actiones per rationes a qualitatibus sumptas elementorum investigari non possunt sed per experientiam magis. . . .

[49] See his *Medicinalium Introductionum Speculum*, Cap. 18; *Repetitio super Canon 'Vita brevis,'* fol. 127 in his *Opera* as edited at Lyons, 1532; *De parte operativa*, fol. 276 in his *Opera*, Lyons, 1532. This edition was lent to me by the Harvard University Library.

[50] See his *De occultis operibus naturæ ad quemdam militem*, Vol. 27, pp. 504–7 in Fretté et Maré's edition of his *Opera*, Paris, 1871–1880; *Summa*, secundæ secunda, Quæst. 96, Art. 2.

[51] See his *De mineralibus*, Liber II, Tract. I; *De vegel. et plantis*, V, II, 6. I have used Borgnet's edition of Albert's works, Paris, 1890–1899, 38 vols.

becomes especially evident in the last few books of his treatise on animals where he often states, "I have tested this," or "I and my associates have experienced,"[52] or "I have proved that this is not true," or "I have not experienced this."[53] In treating of whales he limits himself entirely to the results of his own experience, saying, "We pass over the writings of antiquity on this topic because they do not agree with experience."[54] Albert also often expresses doubt as to certain statements concerning animals on the ground that they have not been tested by experience, even if he has had no opportunity to disprove them; and he draws a sharp distinction between authors who state what they themselves have seen or tested, and those who appear simply to repeat rumor or folk-lore.[55] He is particularly chary of accepting the assertions of Solinus and Jorach, assuring us, anent their assertion that certain birds can fly unharmed through flames, "Those philosophers tell many lies and I think that this is one of their lies."[56]

On the other hand, Albert accepts as the statements of men of experience the stories which hunters, fowlers, and fishermen have told him. Toward such contemporary personal testimony he is, like Bacon, unduly credulous. He says that "a trustworthy person" told him that he saw in an eagle's nest 300 ducks, over 100 geese, about 40 hares, and many large fish, all of which were required to satisfy the hunger of the young eagles.[57] However, Albert is somewhat less credulous than Bacon on the

[52] *De animalibus*, 22, 2, 10; 22, 2, 99; 23, 1, 83; 23, 1, 5; 23, 1, 34; 23, 1, 35; 24, 1, 123, sicut olim in hac scientia probavimus; 26, 1, 10, experti sumus ego et socii mei; 26, 1, 14; 26, 1, 20.

[53] *Ibid.*, 23, 1, 23, experimento probavimus falsum esse; 23, 1, 57, probavi in quibusdam verum non esse; 23, 1, 9; 23, 1, 83; 23, 1, 14; 23, 1, 104.

[54] *Ibid.*, 24, 1, 28. Hæc sunt quæ de cetorum natura nos experti sumus, et ea quæ scribunt Antiqui præterimus quoniam non concordant cum expertis.

[55] *Ibid.*, 23, 1, 40, caps. 18, 20, 21; 25, Introd.; 23, 1, 54, Gryphes aves esse magis tradunt historiæ quam experta Philosophorum vel rationes philosophiæ; 23, 1, 93, Hæc autem potius in historiis leguntur quam sint experimento per philosophiam probata; 23, 1, 101; 26, 1, 47, Sed hoc licet sit famosum tamen a rumore vulgi potius acceptum est quam certo experimento probatum sit.

[56] *Ibid.*, 23, 1, 22. Sed illi philosophi multa mentiuntur et puto quod hoc sit unum de mendaciis eorum. See also 22, 2, 56, Sed iste Jorach frequenter mentitur; 25, 1, 5, Et sicut in multis mentitur Solinus ita et in hoc falsum dicit; 23, 1, 55. Statements by Pliny the Elder are rejected by Albert in 23, 1, 9; 25, 1, 13; 25, 1, 26.

[57] *Ibid.*, 23, 1, 9; also 22, 2, 19, and 24, Introd.

subject of dragons. That the Æthiopians eat the flesh of dragons to cool themselves, that dragons are afraid of thunder and therefore enchanters imitate the noise of thunder with drums in order to capture dragons and ride on them through space, that a dragon by a coil of its tail can crush an elephant: all these reports Albert treats as rumors rather than tested facts.[58] He also suggests that meteors or flaming vapors have been mistaken for dragons flying through the air and breathing forth fire. He has, however, "heard from trustworthy persons" that a serpent with the virgin countenance of a beardless man "was slain in an island of Germany and there displayed in our times to all who wished to see it until the flesh putrefied."[59] Albert also still states that adamant can be broken only by goat's blood, an error which Bacon rejects.[60] On the other hand, one notion which Bacon himself attacks but which he represents as generally accepted, namely, that the beaver when hunted castrates itself to save its life, Albert also rejects, saying that experience near his home has often proved the contrary.[61] Again, Bacon tells how he himself has profitted by an 'experiment' which the magicians pretend to perform by virtue of an incantation. The experiment consists in holding the split halves of a hazel rod apart at the two ends, whereupon the middle portions bend toward each other. Bacon says, "I omitted the incantation and discovered a marvel of nature."[62] But Albert and also John of St. Amand, a medical writer about 1261, both narrate this same marvel of nature and assure us that it works without the incantation.[63]

[58] *Loc. cit.*, 25, 1, 26.

[59] *Ibid.*, 25, 1, 28. Talem serpentem a fide dignis audivi interfectum esse in insula Germaniæ et diu monstratum nostris temporibus omnibus volentibus eum videre donec computruit.

[60] Albertus Magnus, *De mineralibus*, II, ii, 1.

[61] *De animalibus*, 22, 2, 1, 21; and Bridges, II, 168–9. See further Pouchet, 285–6.

[62] *Bridges*, II, 219. Et ego neglexi carmina et inveni opus naturæ mirabile.

[63] *De veget. et plantis*, VI, i, 29; John of St. Amand, *Expositio in Antidotarium Nicolai*, fol. 268 in *Mesuæ medici clarissimi opera*, Venice, 1568. John, however, states that the witches do not assert that their incantations make the sticks bend toward each other, but that the incantations prevent the rods from joining in case the marriage concerning which the witch is consulted is one destined to result unhappily.

It is true that Albert's allusions to experience occur mainly when he is discussing the specific properties of particular things. In his treatise on animals we find such allusions in the books where he is listing and describing particular animals, rather than where he discusses the general natures and common characteristics of animals. This is true again in his treatise *On Vegetables and Plants* where allusions to experience occur especially in the sixth book, in which particular plants are listed and described and, as Albert says, "We satisfy the curiosity of our students rather than philosophy, for philosophy cannot deal with particulars."[64] However, in his *Physics* Albert states that "every hypothesis which is confirmed by the senses is better than that which contradicts sense; and a conclusion contrary to sense is incredible: indeed, a principle which does not agree with *experimental knowledge* acquired by the senses is no principle but quite the opposite."[65]

Other authors than Bacon not only rely on experience, they also mention 'experimenters' and cite experimental books or 'books of experiments.' In short, others than he have conceived the possibility of purposive experimentation, although we find their ideas as to experimental method in the same crude state as his. Bernard Silvestris, a teacher at Tours in the first half of the twelfth century, entitled an astronomical treatise which he composed *Experimentarius*.[66] Early in the thirteenth century Thomas of Cantimpré, in the preface to his *De naturis rerum*, cites "a certain book without name of author which I have heard was compiled in modern times, whose statements you will know wherever you meet them from this indication, that you will find the name *Experimentator* (experimenter) prefixed."[67]

[64] *De veget. et plantis*, VI, i, 1. In hoc sexto libro Vegetabilium nostrorum magis satisfacimus curiositati studentium quam philosophiæ, de particularibus enim philosophia esse non poterit.

[65] *Physic.*, VIII, ii, 2. Omnis autem acceptio quæ firmatur a sensu, melior est quam illa quæ sensui contradicit; et conclusio quæ sensui contradicit est incredibilis: principium autem quod experimentali cognitioni in sensu non concordat, non est principium, sed potius contrarium principio.

[66] Clerval, *Les Écoles de Chartres*, Chartres, 1895, p. 240.

[67] Cited by the *Histoire Littéraire de la France*, Vol. 30, pp. 371–2. Invenies etiam librum quemdam suppresso auctoris nomine quem modernis temporibus compilatum audivi, cuius sententiæ ubique repereris ex hoc cognosces quod hoc nomen 'Experimentator' subsequentibus invenies prælibatum.

The *Speculum astronomiæ*, a treatise probably written by Albertus Magnus, mentions a *Book of Experiments* by the Arab Albumasar;[68] Arnald of Villanova attributes a book of experiments to another Arab, Rasis.[69] Bernard Gordon cites the opinions of "experimenters" in his *Lilium medicinæ* which he began to write in 1303.[70]

As Bacon's experimental scientist was "ashamed to have some layman or old-wife or knight or rustic know facts of which he is ignorant," so Arnald of Villanova admits that the practical man of experience may know more of nature than the bookish scholar. "For since the properties of things cannot be discovered by reason but only by experiment or revelation, and experience and revelation are common to the ordinary man and to the scholar, it is possible that knowledge of properties may be attained by the common people sooner than by others."[71] Arnald not only speaks of "experimenters" but of a "philosopher and experimenter"[72]; and in another treatise states that a certain hypothesis "can be satisfactorily proved by the long experience of any intelligent operator."[73] He also speaks of "rational experiment" which "always presupposes a determined object."[74]

John of St. Amand asserts that *experimentum* alone is "timorous and fallacious," but that "fortified by reason" it gives "experimental knowledge." His idea seems to be, not only that experience must be combined with theory, but also that there should be methodical experimentation. He gives seven rules to be observed in discovering experimentally the properties of medicinal simples: that the simple tested should be pure and free from every extraneous quality, that it should be tested in a

[68] *Speculum astronomiæ*, Cap. 7.

[69] *Opera*, Lyons, 1532, fol. 276.

[70] Bernard Gordon, *Lilium medicinæ*, Venice, 1496, fol. 159 (Pars V, Cap. 12).

[71] From his *Repetitio* super Canon 'Vita brevis,' Opera, Lyons, 1532, fol. 276. Nam cum notitiam proprietatum non possit haberi per rationem sed tum experimento vel revelatione, et experientia et revelationes sunt communes vulgo et sapientibus, possibile est ut proprietatum notitiæ prius habeantur a vulgaribus quam ab aliis.

[72] *Regimen podagræ*, fol. 210–211 in the *Opera*.

[73] *Regulæ generales curationis morborum*, Doctrina IV. Quod potest valde bene haberi per experientiam longam cuicunque operanti et intelligenti.

[74] *Medicinalium Introductionum Speculum*, Cap. 19. Rationabile enim experimentum semper præsupponit determinatum obiectum.

simple and not a complex disease, that several tests be made, that the dose administered should be proportioned to the patient's constitution, and so on.[75]

On the whole one rather gets the impression that the experimental method which Bacon pleads for, as if it were a novelty, is calmly assumed by other writers as a well-established method. It is even doubtful if Roger can be credited with having coined a new phrase in 'experimental science,'[75a] since not only do others employ the adjective 'experimental' and the noun 'experimenter,' but both Albertus Magnus and John of St. Amand use the expression 'experimental knowledge.'

It is significant that others not only duplicate Bacon's positive contributions, but that their experimental method is characterized by precisely the same failings as his. They display the same credulity and love of the marvelous, and are especially prone to mention experiment when they wish to prove something unreasonable, and to support incredible assertions by assurances that they have been tested by experience. They show the same inclination to fantastic 'experiments.' What Arnald's "experimenters" have proved is that a frog's legs bound to the patient's feet for three days, with the right leg on the right foot and the left leg on the left foot, cure gout. What his "philosopher and experimenter" has demonstrated is that application of the magnet has the same effect. To Socrates Arnald attributes this "marvellous and choice experiment." "In young swallows are found two stones, one red and one white. Application of the white stone will raise up a falling lunatic; and the red stone will benefit him, if tied in a bit of skin about his neck."[76] Albert matches Bacon's snake experiment

[75] *Expositio in Antidotarium Nicolai*, fol. 231 in *Mesuæ medici clarissimi opera*, Venice, 1568.

[75a] Sebastian Vogl, *Die Physik Roger Bacos*, Erlangen, 1906, p. 17, says of *scientia experimentalis*, "Diese Bezeichnung tritt in seinem Werken zum erstenmal auf und verschwindet von da ab nicht mehr." Franz Strunz, *Geschichte der Naturwissenschaften im Mittelalter*, Stuttgart, 1910, 120 pp. (no references), also says of *scientia experimentalis*, "Das Wort steht hier bei diesem Gelehrten das erstenmal" (p. 97).

[76] *De epilepsia* (fol. 311 ff. in the *Opera*), Cap. 4. Socrates vero recitat hoc experimentum pro mirabili et electo: in pullis inquit irundinum inveniuntur duo lapides quorum unus est rubens, alter est albus; albus quidem lunatico cadente appositus levabit eum; rubens autem acceptus et ligatus in pelle collo ei apponitur.

by one with a toad and emerald, which he tells to illustrate "the many effects of stones and plants that are known by experience and by which wonders are worked."

"An emerald was recently seen among us, small in size but marvelous in beauty. When its virtue was to be tested, someone stepped forth and said that, if a circle was made about a toad with the emerald and then the stone was set before the toad's eyes, one of two things would happen. Either the stone, if of weak virtue, would be broken by the gaze of the toad; or the toad would burst, if the stone was possessed of full natural vigor. Without delay things were arranged as he bade; and after a short lapse of time, during which the toad kept its eye unswervingly upon the gem, the latter began to crack like a nut and a portion of it flew from the ring. Then the toad, which had stood immovable hitherto, withdrew as if it had been freed from the influence of the gem."[77]

The following experiment with a religious tinge was a favorite with medical writers. I quote John of Gaddesden's version.

"Since many boys and others who cannot take medicine are troubled with epilepsy, let the experiment be performed which Constantinus gives in the chapter on epilepsy in the fifth book of his *Practica*, and Walter in his *Practica*, and Bernard, and Gilbert, and everyone. And I have found it true, whether the patient be a demoniac, or epileptic, or lunatic. If he has a father and mother, let them take him to church after fasting with him for three days, and let him make confession, provided he has reached years of discretion. Then let them go on Friday in the fast of four seasons and hear mass, and let them repeat this on Saturday. On Sunday let a good religious priest read in church over the patient's head the Gospel which he reads in

[77] *De veget. et plantis*, VI, ii, 1. Smaragdus enim nuper apud nos visus est parvus quidem quantitate et mirabiliter pulcher, cuius cum virtus probari deberet, adstitit qui diceret, quod si circa bufonem circulus smaragdo fieret et postea lapis oculis bufonis exhiberetur, alterum duorum, quod aut lapis frangeretur ad visum bufonis si debilem haberet lapis virtutem, aut bufo rumperetur si lapis esset in naturali suo vigore: nec mora factum est ut dixit et ad modicum temporis intervallum, dum bufo adspiceret lapidem nec visum averteret ab ipso, crepitare coepit lapis sicut avellana rumperetur et exilivit ex annulo una pars eiusdem, et tunc bufo qui ante stetit immobilis, cœpit recedere ac si absolutus esset a lapidis virtute.

September after the harvest feast of the holy cross in the days of the four seasons. Moreover, let him devoutly write the same, and let the patient wear it about his neck and he will be cured. The Gospel meant is the passage, 'This kind of demon is not cast out except by fasting and prayer.' "[78] Many more such 'experiments' might be given.

In reality, therefore, Bacon's discussion of experimental science, instead of being a wonderful original contribution to knowledge, is an excellent representation of both the good and bad points of an important movement of the time in the direction of experimental method. Crude as this tendency may be, it at least demonstrates that the interests of the period were not exclusively scholastic.

Two further questions concerning experimental method in the middle ages suggest themselves. Was there any positive advance in this respect over the science of the classical period? How are we to explain the association of so much superstition with experimental method?

To the former question I incline to answer, Yes. Pliny the Elder, whose *Natural History* (written in the first century of our era) was a compilation of all previous science, should know of experimentation if it had ever amounted to much hitherto. He frequently uses the word *experimentum* but seldom in such a way that it is best translated 'experiment.'[79] He never uses

[78] John of Gaddesden, *Rosa medicinæ* (written in the early fourteenth century). Papiæ, 1492 (Joannes antonius birreta impressioni tradidit). Et cum multi pueri et alii qui non possunt uti medicinis vexantur epilepsia, fiat experimentum quod ponit Constantinus 5 practicæ suæ c. de epilepsia, et Gualterius in practica sua et Bernardus et Gilbertus et omnes. Et ego inveni illud verum sive sit demoniacus sive lunaticus sive epilepticus. Si patrem habet et matrem, ducant eum ad ecclesiam facto jejunio trium dierum a parentibus et a patiente, si sit tantæ ætatis quod sit compos sui, et confiteatur. Deinde vadant die veneris in jejunio quatuor temporum et audiant missam de die et similiter in die sabbati. Die dominica sequenti sacerdos bonus religiosus legat supra caput patientis in ecclesia evangelium quod legit in septembri tempore vindemiarium post festum sanctæ crucis in diebus quatuor temporum. Tunc etiam scribat illud idem devote et portat circa collum et curatur; et est evangelium ubi dicitur, Hoc genus demonii non ejicitur nisi in jejunio et oratione. The same recipe occurs in Bernard Gordon's *Lilium medicinæ*, Partic. II, Cap. 25, fol. 76.

[79] Often it simply means experience, as in the passage, "Let him marvel at this who has not observed by daily experience that the herb called heliotrope always

the words 'experimental' and 'experimenter', which are post-classical. Several of our mediæval writers cite Galen as an authority for the recognition of experience as a criterion of truth.[80] It is true that Galen, writing a century later than Pliny and showing an advance in anatomical and medical knowledge over his predecessors, approaches more closely the conception of experimental method. He himself engaged in original research in anatomy, dissecting and vivisecting, and proving by actual experiment that the arteries contain blood, not air.[81] It is true, as John of St. Amand and Peter of Abano state, that Galen makes both reason and experience criteria of truth in medicine;

turns toward the sun." II, 41, 2 (Edition by Lemaire, Paris, 1827): see also, II, 41, 1; II, 108, 1; VII, 41, 2; VII, 56, 3; XIV, 8, 2; XVI, 1, 3; XVII, 2, 3, and 12; XVII, 35, 9; XX, 52, 1; XXII, 51, 2; XXIII, 59, 1; XXV, 106, 2. Again it may be rendered as "example" or "actual instance," as when Pliny says, "We have instances (experimenta) and examples (exempla) in the last census" of men who have lived over 120 years. VII, 50, 3; also, II, 54, 2; VIII, 7, 2; IX, 86, 1; XXII, 49, 5; XXVIII, 45, 2. Or it may mean use, as in the passage, "Reeds useful in both war and peace," or where it is stated that most plants "have been recommended for frequent use by their edibility or odor or beauty," XVI, 64, 1; and XXII, 1, 1. When Pliny tells that Claudia was shown to be chaste by a religious ordeal, the phrase used is, "religionis experimento," VII, 35, 1. Often the word means 'test,' as when Pliny discusses ways of testing the genuineness of gems, the freshness of eggs, and the realism of paintings: see V, 1, 12; X, 75, 1; XIII, 3, 1; XIV, 25, 7; XVII, 4, 2; XX, 3, 1; XX, 76, 5; XXII, 23, 1; XXIII, 31, 1; XXVIII, 7, 2; XXIX, 12, 1; XXXI, 27, 2; XXXI, 28, 2; XXXIII, 19, 2, and 43, 1, and 44, 1, and 57, 2; XXXIV, 26, 3, and 39, 2; XXXV, 36, 2; XXXVI, 38, 1, and 55, 2; XXXVII, 22, 1, and 76, 1–2. Purposive action is clearly suggested in only a few cases: namely, where Pliny says that experiments cannot entirely duplicate nature in the grafting of trees; where he describes as an experiment the marking of a dolphin's tail in order to learn the dolphin's age, if it should be caught again; where a well was sunk to prove that the sun casts no shadow at noon of the summer solstice; and where a man was cast into a pit of serpents at Rome to discover if he really was immune from them. XVII, 26, 3; IX, 7, 2; II, 75, 1; XXVIII, 6, 1; and perhaps, XXVIII, 14, 3; XXIX, 4, 1, and 8, 3.

Of course, in the middle ages, too, the word 'experimentum' does not always carry the meaning of experiment. It may indicate experience, or be used of the results of experience. Recipes as well as procedures, often mere lists of ingredients which are to be tried or are supposed to have been successfully tested as remedies against various diseases, are often called 'experimenta' by medical writers. Thus Bernard Gordon gives nine 'experimenta' for eye troubles. ***Lilium medicinæ***, Partic. III, Cap. 5, fol. 94.

[80] Pietro d'Abano, *Conciliator*, Diff. X, fol. 15; Diff. LX, fol. 83. Jean de Saint-Amand, *Expositio in Antidotarium Nicolai*, fol. 231. Arnald of Villanova, *Repetitio super Canon 'Vita brevis,'* fol. 276.

[81] See Vol. II, pp. 642 and 646–649; IV, 703–36 in Kuhn's edition of Galen.

but as he insists that they ought not to be employed simultaneously, he misses the essence of experimental method. He further objects that experience is unscientific, irrational, and that it "requires good fortune to find what is sought." Once he identifies it with mere observation.[82] The Empirics were the chief advocates of experience in the ancient medical world, and Galen broaches the topic mainly in connection with allusions to their sect. He usually depicts them as over-emphasizing experience and neglecting reason, as regarding phenomena only and ignoring causes, as learning what drugs to use from dreams and chance, and as trusting unquestioningly in authorities and tradition for information concerning the experience of past ages.[83] The Empirics themselves insisted that experience was a scientific method.[84] They distinguished three kinds, of which Galen unfortunately gives no further description, namely, accidental, off-hand, and imitative.[85] They held that observation of a single instance was not enough, but that repeated observation with things remaining in the same condition was necessary.[86] Thus they seem both to have had some of the faults of our mediæval scientists and to have had at least some notion of controlling the results of experience. Indeed, Galen himself believes that the properties of medicinal simples can and should be learned from experience, and gives some rules for testing their effects from which John of St. Amand seems to have developed his longer directions.[87] Admitting, however, the debt of the middle ages to Galen, it seems true that they rely more frequently on experience than the ancients did; that they apply it more generally through the field of science, rather than merely to medicinal simples as Galen did, or to medical practise as the Empirics did; that they have developed the theory of occult virtues which can be discovered only by experience; that they have 'experiments' and 'experimenters' and entire books called

[82] Kuhn, X, 28–31: also I, 131 and 138; XIV, 675–6.
[83] Kuhn, XIV, 220 and 245, 679–680; I, 143; also XVI, 82; I, 76 and 134.
[84] Kuhn, I, 76.
[85] Kuhn, XVI, 82.
[86] Kuhn, I, 135.
[87] Kuhn, XVI, 85–87; XI, 485 and 518.

experimental. Others besides Bacon seem conscious that science is finding a new method in their day, and Peter of Spain, in stating his sources of information, speaks of "ancient philosophers" but of "modern experimenters."[88]

As for the other matter, the credulity, the superstition, the element of marvelousness, which seem to vitiate the experimental tendencies of Bacon and his contemporaries,—these are to be explained as the result of a real connection between experiment and magic. There is abundant evidence for this. Bacon, it is true, asserts that experimental science exposes and shuns all the follies of the magicians, but he admits that many persons confuse it with magic because of the marvels which it works, and he himself especially associates it with the occult sciences of alchemy and astrology. It makes gold such as neither the art of alchemy nor nature can produce; it can predict the future better than astrology.[89] It teaches one to choose the proper constellations for his undertakings, and to use the right words at the proper times;[90] it can construct "philosophical images and incantations and characters" which are vastly superior to those of magic;[91] it can alter the world about us, and incline and excite the human will, though without coercion.[92] Moreover, Bacon's ideal experimental scientist does not scorn to take hints from wizards, while Roger himself derives his hazel rod experiment from the magicians. The snake experiment of his sage at Paris sounds more like the trick of a Hindu conjurer than the procedure of a modern laboratory.

One gets the same impression from Bacon's contemporaries. The conception of occult virtue, which leads them so often to rely on experience, is a more or less magical notion, akin to the *mana* of primitive magic.[93] Believers in astrology, divination, and fascination also appeal to experience. Vincent of Beauvais

[88] Petrus Hispanus, *Thesaurus pauperum*, Frankfurt, 1578, Preface. In libris antiquorum philosophorum et modernorum experimentatorum.

[89] *Little*, 46; *Gasquet*, 510.

[90] *Little*, 52.

[91] *Ibid.* 53.

[92] *Gasquet*, 510. Opera vero istius scientie quedam naturalia sunt in alteratione mundi, quedam in excitationem et inclinationem voluntatum sine coactione.

[93] For "L'idée de *mana*" see H. Hubert et M. Mauss, "Esquisse d'une Théorie Générale de la Magie," *L'Année Sociologique*, 1902–03, pp. 1–146, especially 109 ff.

says that divination from portents is proved by many experiences, and that the influences of the planets upon our world were discovered by philosophers by "sure experiments" as well as by "convincing arguments."[94] Albertus Magnus assures the reader that divination from dreams is "no idle report but the testimony of experience."[95] In another treatise which has sometimes been attributed to Albert we read, "When the soul of any person is raised to great excess of some passion, it is found by manifest experiment that it binds and alters objects as it wishes."[96] The experiments of Bacon's contemporaries, too, are often more like feats of magic than like scientific tests. Gaddesden's experiment employed an incantation and amulet. Peter of Abano experimented with an incantation and an astronomical image; and a necromantic book attributed to him bears the sub-title, "A book of marvellous experiments."[97] Michael Scot describes "a chiromantic experiment," and mentions "love experiments" and the experiments of necromancers and magicians.[98] Arnald recounts an "experiment" performed by an old-wife of Salerno to help women in childbirth. It consisted in taking three grains of pepper; saying a Lord's Prayer over each with substitution of the sentence, "Deliver this woman from the pangs of childbirth," for the words, "Deliver us from evil"; giving the grains one by one to the woman to be swallowed in wine or water without touching the teeth; and finally uttering this incantation with three Paternosters in her right ear,

[94] *Speculum naturale*, XXXII, 119; XVI, 43.

[95] *De somno et vigilia*, III, i, 2. Est enim hoc non auditus inanis sed experientiæ testimonium.

[96] *De mirabilibus mundi*, p. 159 in an edition of Amsterdam, 1740 (Columbia University Library), where it is bound with the *De secretis mulierum*. These works are omitted from Borgnet's edition, but there are no very convincing reasons for doubting Albert's authorship. The passage reads, "Cum igitur anima alicuius fertur in grandem excessum alicuius passionis, invenitur experimento manifesto quod ipsa ligat res et alterat ad idem quod desiderat."

[97] *Heptameron seu elementa magica;* bound with the *Opera* of H. C. Agrippa Lyons, 1600, pp. 441–462 (Cornell University Library).

[98] *De secretis naturæ* (a portion of Scot's long work on astrology which is printed in the edition of Amsterdam, 1740, mentioned in note 96), Cap. 18, In chiromantia est illud experimentum, etc. Bodleian ms. 266, fol. 22 v. quotiens nigromantici vel magi volunt experimentorum aliqua operari veraciter; and fol. 106 r. hec stella est multe efficacie ad experimenta amoris.

Bizomie lamion lamium azerai vachina deus deus sabaoth
Benedictus qui venit in nomine domini osanna in excelsis.

Arnald condemns this procedure as diabolical and contrary to the Faith, but he calls it an experiment nevertheless; and earlier in the same treatise describes approvingly a very similar experiment by which a priest cured him of warts.[99] Albert concludes his tale of the toad and the emerald by stating that there are many other effects of stones and herbs, which we learn by experiment, and which magicians study, and work wonders by means of them.[100] In the *Speculum astronomiæ* he calls "experimental books" those which deal with different varieties of divination, namely, aeromancy, pyromancy, hydromancy, geomancy, and chiromancy; and he declares that such books ought not to be called science, [101] which recalls Bacon's remark that to some men experimental science seems false and unworthy of a Christian. In a treatise entitled *Apollonii Flores aurei*,[102] which treats of the Notory Art of miraculous acquisition of knowledge by incantations and invocation of spirits, experiments and experimental science are again mentioned in the same breath with the above named varieties of divination. Books "which are nigromantic or contain the experiments of lot-casters" were condemned at Paris in 1277 together with the opinions of Siger de Brabant.[103]

This is not the place to discuss magic, but from further investigation which I have made of its history and its relations to science[104] I have little doubt that the connection between it and

[99] *Breviarium* (fols. 150–205 of the *Opera*), III, 4; and II, 45.

[100] *De veget. et plantis*, VI, II, 1. Sunt autem multi alii effectus lapidum et plantarum qui experimento accipiuntur in eosdem in quibus student magici et mira per eos operantur.

[101] *Speculum astronomiæ*, Cap. 17.

[102] This treatise is contained in two manuscripts of the fourteenth century at Munich, *Cod. Lat.* 268 and 276. See fols. 5–6 of the latter.

[103] Denifle et Chatelain, *Chartularium Universitatis Parisiensis*, I, 543. Libros, rotulos, seu quaternos nigromanticos aut continentes experimenta sortilegiorum.

[104] Lynn Thorndike, *The Place of Magic in the Intellectual History of Europe;* New York, 1905. "The Attitude of Origen and Augustine to Magic," *The Monist*, XVIII, 46–66 (January, 1908). "Julius Firmicus Maternus, A Roman Astrologer as a Historical Source," *Classical Philology*, VIII, 415–435 (October, 1913). An article on "Some Mediæval Conceptions of Magic" will soon appear in *The Monist*.

experimentation which our authors suggest is real. But this is not so much to the discredit of science as it is to the credit of magic. After all it is not surprising that magic, which was curious and tried to do things and to attain practical results, and which as long ago at least as Pliny the Elder's day had investigated nature,[105] should experiment. It is indeed possible that magicians were the first to experiment, and that science, originally speculative, took over experimental method, as well as the conception of occult virtue, from magic.

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[105] The *magi* stand out in the pages of Pliny's *Historia naturalis*, not as mere sorcerers or enchanters, but as those who have gone farthest and in most detail,—too curiously, in Pliny's opinion—into the study of nature.

THE PROBLEM OF KNOWLEDGE FROM THE STANDPOINT OF VALIDITY.

(THIRD ARTICLE.)

BROADLY generalizing, we may say, there are two ways in which the problem of knowledge almost inevitably presents itself. On the one hand it is conceived to be primarily the problem of validity, the ultimate question being: What is it that constitutes *anything whatever* knowledge? On the other hand it is apprehended as essentially a question of import, and import, when analyzed, is found to be identical with what may be variously designated range, amount, degree, or generally speaking, quantity. Underlying this latter view is the reasonable assumption that knowledge is a thing which admits the distinction of more and less. Accordingly it seems natural to suppose that the concept of knowledge will itself be determinable by the same considerations which determine its increase. Its differentia, that is to say, will be found in the more-and-less distinction, and an intelligent grasp of the latter will be looked upon as the only legitimate object of the inquiry. What makes knowledge, then, is just what makes it more, and to understand what *more knowledge* means and what distinguishes it from less, is to understand the thing itself. But more knowledge, to put it as briefly as possible, is the same thing as knowledge that means more. The whole question is therefore one of import.

Thus, on the one view, degree or amount is a secondary feature of the thing which admits such variation; and the defining character of the latter is to be sought in a supposed validity which, whatever its basis, must be prior to a distinction which presupposes it. On the other view, there can be no question of validity which is not a question of degree, and to seek a fixed definatory formula independently of this consideration is to commit the fallacy with which Hegel charges the Critical Philosophy.

Now it is evident that import or significance—the fulness of

content in knowledge or what, as such, knowledge means—cannot be a matter of indifference in determining the concept. But the position here assumed is that significance of itself is not sufficient to define the character of knowledge. The mode in which the significance manifests itself must be taken into account; and there is surely a sense (and that a very true sense) in which it is possible to *know* a content of relatively low significance, and to know it better than a more significant content. In this case, whatever the connection, there must be a difference of *meaning* between the ideas of *more knowledge* and *better known;* and knowledge itself becomes the prior concept required in order to determine the special significance of more and less in this respect. We are left therefore with the notion of validity as the determinant factor; and of this it remains to complete the concept.

Keeping in mind the expediency of reserving final metaphysical issues, and confining ourselves to the actuality of knowledge as a fact which must be assumed, we may return to our illustration—viz., the residual knowledge obtained by the elimination of unwarranted interpretation. The import of such knowledge may not be great—although it is by no means clear that this need be so.[1] But the slightness of the import does not in any way interfere with the value of the instance; for it is just in such cases that the other factor in validity (the mode of presentation) is likely to be of greatest weight.

[1] On the metaphysical character and epistemological value of *sensation* there are several striking utterances in Professor W. E. Hocking's recent remarkable volume: *The Meaning of God in Human Experience. Vid.* especially pp. 301–2; 313; and appendix III, on "The Knowledge of Independent Reality", reprinted in part from an article published in the PHILOSOPHICAL REVIEW, Vol. XIX, No. 3, May, 1910, under the title, "How Ideas reach Reality." The present writer greatly regrets that he has been unable to avail himself in these articles of the stimulus of Mr. Hocking's work—the more so as the analytic method here employed, by emphasizing distinctions, may have given rise to the appearance of a much greater difference between us than really exists. The antithesis suggested between religious truth and the 'gross actualities' of historical development must (if it be allowable to anticipate) not be taken in any sense that would exclude an ample recognition of the metaphysical and religious import of history and, generally speaking, of the 'literal' in experience. The 'Creativity of Religion' and the 'Prophetic Consciousness' are undoubtedly among the essential and legitimate, as they are perhaps the most refractory, elements in a complete metaphysical treatment of the subject.

The reduction of a misinterpreted or over-interpreted experience of sense to a simple and indisputable nucleus is apt to be explained in a somewhat misleading way. There is danger of saying, for example, that when I have removed all that I wrongly took the experience to mean I am confronted with the certain knowledge of my sensation as such, that what I really know and cannot help knowing is that I am experiencing a sensation, say, of green color. What is wrong in this is that it appears to impart a subjective turn to what may, in any case, very well be, and in the sense here involved must be a completely objective content of knowledge. That is, what I know is probably not anything about my sensations as such or about myself as having them, but merely that the object presented is a green color. And even if the content of my knowledge in this instance is myself or my sensation, still, as a subject for validity, the content must be entirely objective.

We must now ask: What is it that constitutes the irrefragable validity of the knowledge contained in an experience of this type? The answer can only be: It is the complete commensurability between the object actually present to sense and the meaning of that object. Or, we might say, it is the fact that a more or less significant import has become actualized in a presentation. As has been hinted, the import even in such cases is not always or necessarily insignificant, and there is no need to suppose that the process of reduction must always terminate in a minimal presentation such as we have assumed. Everything depends on the capacity of the presentation as such to sustain significance. It will be said that there is no meaning in such language, since import is not a simple character resting upon or inherent in the individual presentation, but a complex product of many factors, implying above all the agency of what logic calls mediation. And this may be true; but neither is the presentation as such ever a completely simple and undifferentiated character. Indeed, in arguments like that involved in the illustration of a minimal knowledge, it is apt to be forgotten how great is the range and complexity of the presentations which are continually pouring in upon us in the actuality of experience.

In view of this we may safely assert that whether or not it is the normal character of knowledge that the interpretative factor be far in advance of what we might call the presentation equivalent, the latter constitutes a manifold of inexhaustible richness. Nor must it be forgotten that in our ordinary mental economy we find it as safe as it is convenient to dispense in attention with much the greater part of the presentation complex, thus investing the remainder with all the greater import. Whatever may be the risks and potential disasters due to such a procedure, it at least implies that we ordinarily find the presented data in excess of the strict requirements of knowledge, and that in the actual adjustment of factors we have no hesitation in entrusting to a few representative sensations a vast weight of significance. Of course the representative function is here symbolic—which means that there is a thorough disproportion between the actuality of the sensation (or the sensation reduced to minimal terms) and the range of significance attributed to it. It may be, however, that when we consider the combined intricacy and uniformity of experience, there are complications which a relatively simple presentation may acquire with all the force of a fundamental characterization, and which therefore cannot be shed off except in the analytic processes of abstraction. If so, there is no epistemological significance in the apparent disproportion between presentation and interpretation. Whether there are such complications is all a question of how far the element of necessity is capable of entering into experience as such. The view we have designated rationalistic does not count upon such a necessity as genuine; and Kant's view, which establishes or assumes the necessity of the ideal principles underlying experience, does not succeed, as we have seen, in sustaining this same necessity within experience itself. But that experience even in its material or empirical aspect contains its own necessities is clear from the case of the minimal presentation alone. A sensation of green color cannot as such sustain the significance of a sensation of red as such. And when we have admitted even this amount it becomes apparent that the mere fact of an orderly uniformity is not conceivable apart from a

large proportion of necessity in the elements themselves. At all events, in case of uncertainty or falsification arising out of the disproportion referred to, the first consideration is to reestablish the disturbed balance between the two sets of factors. This of itself indicates the epistemological significance of the equilibration. The method employed involves either the elimination of interpretative accretions in the manner already made clear, or, if the difficulty is due primarily to the neglect of actual data, the attempt to restore the presentation equivalent. The examination of witnesses naturally takes one or other of these forms according as the motive is to destroy or to establish evidence.

The defining character of epistemological validity in such instances as we are now considering must therefore be understood to lie, not in the amount of import as such, but in a certain proportionateness between import and the experiential conditions of the case. Of course the equivalence involved is not a proportion between abstract sensation, devoid of all significance on the one hand, and pure, undirected mental elaboration on the other. If it were so there could be no talk either of interpretation or of commensurables. The unit in each case is a complex directly or indirectly involving both elements. By an equivalence therefore must be understood the perfectly normal condition whereby a presentation accepts an additional and perhaps relatively free connotation on the same grounds of legitimacy as those on which it accepted and continues to maintain an original meaning or complication. The acquisition of meaning is an original character of sensation itself, apart from which we cannot *know* our sensations; and throughout the development of conscious life the understanding of our experiences is an integral part of the way in which we *have* them. It is true that the primitive import of sensation is quickly discarded or fundamentally modified. But this is what we should expect. Experience does not at once attain the level of its inherent necessity. In speaking of the legitimacy of an original complication, and in describing the acquisition of meaning as an original character of sensation we do not imply that the primitive meaning can claim special epistemological legitimacy.

There is need to emphasize the difference between the primitive meaning and the residual meaning (got by elimination) for which peculiar validity was asked. In a way no two things could be more unlike. The former is the product of loose association in an experience as yet fluid and opaque; while the latter involves the discovery of a limit in the flux of experience by an act of reflective analysis. The stripping off of interpretative elements is in itself an act of interpretation of a very precise order, differing from scientific procedure, not in the exactitude at which it aims, but in the fact that it seeks to terminate at the opposite pole of knowledge in the completeness of a uniquely individual existent rather than in a completely idealized representation.[1]

If language is wanted in which further to define the condition of knowledge at the presentational pole of knowability, it will be found in some such expression as 'a luminous whole of intuition'—the idea being that the presented and the interpretative factors constitute a unity which is not that of association but of necessary implication, and which, upon examination, will reveal itself as a condition of the presentation. What in any experience we are entitled to suppose we know, is the meaning which we see cannot be denied of the presentation without destroying the experience itself.

When we turn to the opposite pole of knowledge we are confronted with a significant difference—the absence of the experiential factor;[2] and just as the danger before was that the condition of knowledge as stated seemed to carry with it the excessive elimination of import, so here the difficulty is that the presentational element on which such stress has been laid is almost or

[1] Of course the interpretative act, which must here be retrospective, is not to be confused with that which gives us the ideo-presentational complex in the first instance. Rather it is an act of interpretation brought to bear upon a prior interpretation, and it reveals to us on reflection the limit of assured legitimacy within the original interpretation of the content actually presented.

[2] It is not meant to deny experience in every sense to such knowledge, but only in the sense appropriate to the type of knowledge previously considered. Doubtless there is a sense in which we can intelligibly maintain an experience of mathematical or religious truth—two somewhat different cases. But while Mr. Hocking is right in insisting that the knowledge of God is matter of experience and must be of the same 'literal' character as an experience of sense, it is in the *literalness* rather than in the *character* of the experience that the identity lies.

altogether wanting. In the one case the presence and in the other the absence of this element is taken to have all the significance of a differentia. How then, it will be asked, can we hope in this way to obtain a uniform conception of knowledge?

In answer to the question it must be pointed out that the assumption has all along been that of a double character in knowledge. This of itself calls for a difference in the conditions; and if the difference implied is the presence or absence of experiential actuality, then it falls within the concept and brings us back to our previous position that knowledge must be defined so as to include the difference of the scientific and the non-scientific.

Beneath the apparent opposition between the two forms there is evident a close similarity. In each case the condition of validity is the resolution of a conflict or incommensurability between experiential and ideational or ideal elements; for we may assert of the validity of mathematics that it too depends upon elimination, resulting in a 'luminous whole of intuition.' Only the term intuition has no shade of sensuous connotation. It is not on that account unsuitable; and perhaps no language better expresses the common epistemological significance of the two cases than when we say that in the one instance we know a thing because we *see* it, while in the other we know a set of ideally exact relations to hold because we *see that* it must be so.[1]

We have therefore reached a formulation of knowledge which, though highly general, will hold of each of the extremes involved. It is not claimed that it is free from difficulties or defects. For one thing it is both narrow and negative, applying as it does only to extreme instances, and these perhaps the most artificial forms of knowledge, and availing itself chiefly of elimination in the establishment of validity. Surely, it will be said, elimination is the least of the factors involved. Moreover, what becomes of the vast world of knowledge represented in the practical judg-

[1] The Greek word *θεωρία* in its divergent senses contains the element of meaning common to an intuition dependent upon the presence and one dependent upon the absence of the sensational concomitant; and we may claim the full connotation of the term for our definition of epistemological validity as that form of validity which is essentially *theoretical*.

ments and generalizations of experience and in the body of the sciences outside mathematics and the mathematical disciplines? Do these conform to the type represented in the phrase 'a luminous whole of intuition'? Where do they find their place in the universe of knowledge? The latter has been represented as bi-polar, with experience (apparently in a highly sublimated form) at one end and mathematics at the other. Are the remaining forms (constituting the great bulk of our knowledge) variously located between these extremes? Or must we conceive their relation to the extremes in some other way? Must we in the end deny them a place in knowledge altogether? In any case will this description in the long run hold; and can we reasonably look upon mathematics and experience, so far as knowledge is involved in both, as polar opposites?

It is impossible here to attempt a circumstantial answer to these questions. But two propositions may be laid down. These are involved in any answer given, and they will serve to indicate the lines which further inquiry would necessarily take. In the first place, whether or not it be clear that the present formulation of knowledge is adequate to cover all cases, it certainly seems to bring within the pale of possibly knowable truth provinces of experience and the conscious life which other theories have been content to relegate to the unknowable, but which in other respects than that of strict epistemological validity appear to contain the key to the chief questions of existence. One more reference to Kant's difficulty will help to make this clear. Kant excludes the whole realm of religious and ethical truth from the conditions of strict knowability. In the sense defined in the *Critique of Pure Reason* I can know neither myself (as a free agent) nor God nor yet the relations which hold of such beings in a realm of freedom. The reason for this is that these entities when considered from the standpoint of their knowability are found to belong to the region of metaphysical speculation, where nothing can really be known because the condition of experiential verification is wanting. If however the experiential condition (in the narrow sense here required) is no longer considered a differentia of knowledge as such, but only of a

specific kind of knowledge, then the door is opened for the inclusion of a universe of profoundly significant meanings among subjects of possible cognition. Nor does the removal of the experiential qualification imply the relegation of known religious and ethical truth to a realm remote from the concrete interests of life. The connection between the presentational and ideational types of knowledge is not denied; but certain inadequate ways of postulating the connection have been discredited; and certainly nowhere more than in the realm of spiritual realities is there a persistent demand for a restatement of the relationship between the ideal and the actualities of experience—a restatement which will have to begin with a critical dissociation of the two. Neither religion nor morality can ultimately suffer from anything that counteracts the overwhelming tendency in human nature to identify the ideal concepts and demands of both with the gross actualities of history and historical evolution; and if we are compelled to give up this crude identification bit by bit, it is sure to be for the eventual good of the interests involved. A set of ideas which seem for ever to evade the actuality of our human lives is not lost to us so long as these ideas retain at least their critical power; and as in the parallel case of the opposite poles of knowledge, our ultimate problem may be to discover the nature of this connection and render it of practical effect. Altogether it may prove a great gain to us that God is not visible to human eyes[1] and that freedom is not among the physical and physically apprehensible conditions of our existence. In this very circumstance may lie not only the spiritual significance but the knowability of both. The ideal qualification which experience and the things of experience reject may be accepted by that which transcends the limit and the content of experience; although if language is needed to express the manner in which such knowledge actualizes itself in consciousness, no other expressions will be found so appropriate or so intelligible as 'experience' itself —an experience, however, from which the sense reference has been (artificially, if need be) removed; and if the transcendence of experience (in the narrower sense) does not

[1] Note the Hebrew insistence on the religious value of the idea of an unseen God.

render truth unknowable in the sphere of mathematical science, there seems no reason why it should do so in other spheres. Thus beyond the convictions of superstition or of faith there may be reserved for the religious and moral intuitions a guarantee of knowability as certain as anything can be. Here as elsewhere the condition will lie in the possibility of the intuitions becoming 'luminous'—that is, attaining a mental expression in which import and necessity shall be found inextricably implicated—the case of *θεωρία*.

The second proposition to be laid down is a statement (really a restatement) of principle. The question of knowledge in the end is the question of validity; and if the formulation of this seems to endanger a large part of what we commonly suppose to be knowledge, we must be prepared to accept such a contingency. Outside of radical empiricism it would perhaps be difficult to formulate the idea of validity with any degree of strictness without appearing to limit the range of the reality known. And this is natural, since epistemology involves a critical examination of knowledge. We should hardly expect the whole body of the latter to pass unchallenged. The probability is (it seems reasonable to suppose) that until knowledge is clearly defined it will be confused with other things, and consequently that the sum-total of the strictly known will ordinarily be less than is thought. In the present case, however, it is by no means certain that the range of knowledge need be unduly restricted by the criterion. Indeed, the peculiarity of the latter is that it gives promise of including in a single formula the most diverse kinds of knowledge. In the two forms that have been chosen for special consideration, the particular knowledge of sense experience and mathematical knowledge, the condition of validity can be more forcibly demonstrated because it rests upon a limiting case; but the common formula which emerges does not necessitate the presence of a limit. All that is demanded is a certain equivalence of subject and predicate, which can be placed in such a light that it becomes transparent. The uniqueness of sense experience on the one hand and the purely ideal character of mathematical truth on the other furnish the condition of such a transparent

equivalence. But when we come to the wider generalizations of experience and to the empirical sciences, working with hypotheses, it is not so easy to realize the required condition. In these cases, however, we do not claim the same completeness of assurance that characterizes the limiting instances. Knowledge becomes more problematical. Yet if we consider the ideals which control it and in which it strives to terminate, these will be seen to involve the self-same formula of validity which is the guarantee of knowledge in the spheres of mathematics and of actual experience. The peculiar difficulty arises from the fact that while the aim is a relation of equivalence between the data of experience and certain universal formulae, the conditions of the case do not permit the free use of the method by elimination. We are here, generally speaking, forbidden to *prepare* our subject-matter specially with a view to validity, and are compelled to reach out equally to the two divergent poles of knowledge.

These statements, however, must be seriously modified in the direction of our formula. We must give due weight to the difference of ideality, so to speak—a difference both of range and quality—to be found among the different sciences and in the same science at different levels of development. At the level of empirical generalization the universality which we predicate is not badly apportioned to the object. For the universality of repetition has significance only where a more explicit form of ideality is not available—that is, where the data are as yet crude and obscure—and therefore makes less exacting demands upon the data than any form of ideality. Of course the empirical generalization is highly precarious; but where advancing knowledge explodes previous generalizations what happens is not merely that the equilibration of the interpretative and experiential elements has been upset, but that fresh experience has revealed new characters in the data, thus leading to a deeper interpretation and one more in consonance with the facts as now known. At the lower level of generalization, however, it must be agreed, we do find a kind of equivalence between the experiential factor, which is here less precise than in the unqualified individual experience, and the interpretative, which, as implying

merely repetition, is only slightly significant. The conditions of knowledge are therefore not wanting even on the present formulation, based upon the extreme instances of mathematics and non-generalized experience. And from the point of view of strict validity we should say of this approximation to knowledge that it represents a phase in which the individual experience abandons the shelter that legitimacy derives from uniqueness—but only so far as to seek shelter in a succession of precisely similar individual experiences.

Of even more significance is the fact that the advance in knowledge which succeeds the stage of empirical generalization reproduces the very feature—elimination—in which we have sought the means of reaching a guarantee of validity. In the two limiting cases we remove opposite factors, on the one hand excess of interpretation, on the other the inexact element of sense. But here the process of elimination proceeds simultaneously from both ends and involves at once the sorting out of instances and a more exacting determination of import. Thus once more there is the same endeavor to find the conditions of a transparency between the two factors. And when we come to experiment, what we have is a superlative instance of double elimination, resulting in the paradox of an a priori, ideal determination of actually given presentational elements. The significance of universality is subordinated to the exact specification of character in a way that begins to suggest the even completer idealization of mathematical science.

The same significance appears to attach to elimination when we consider knowledge in another aspect—the aspect, viz., in which it has to do with the division of the sciences and the discovery of the principles which constitute a secure basis for scientific progress. Here again of course the mathematical sciences represent the limiting instance; but what is more to the point is the fact that the principle seems to hold of the concrete sciences as well. The scientific superiority of the Darwinian over earlier forms of evolutionary theory consists in the exactitude with which Darwin succeeds in eliminating excessive hypotheses. It is a case of successful abstraction; and the effect

is at once enormous empirical verification and great precision of principle—the two features that mark off the limits of genuine knowledge.[1]

In conclusion some remark is called for in mitigation of a difficulty arising out of the designation of knowledge in terms of validity rather than of completeness or degree of adequacy. Validity appears to be too absolute a criterion—perhaps an abstract ideal—resting as it does upon the hard antithesis of right and wrong—known and unknown. Now it is not the intention here to deny a very genuine and significant meaning to the notion of degrees of knowledge. Of this the rejection of the Platonic tendency to identify knowledge in the true sense with its scientific form is evidence enough. On the other hand, it seemed necessary that, once the non-scientific was admitted to a legitimate place in the realm of knowledge, the significance of the admission should not be weakened by the refusal to accord such knowledge independent worth. In other words it was thought essential that the non-scientific, if it contained the element of knowledge at all, should be shown to have its own intrinsic validity. This position is, moreover, advanced partly by way of a prophylactic against what may be designated the over-easy epistemological tendency in certain phases of idealistic thought. The wholesale handling of the problem as altogether a matter of degree contains its dangers, because it seems to ask far too little as a condition of knowability. And when this is conjoined to the tendency to designate the universe of knowledge, thus generously interpreted, in terms of the scientific,[2] the danger amounts to no less than that in which as a matter of fact it really issues—viz. the complete stultification of the epistemological problem. On such grounds as these the criterion of knowledge was sought in the first place in the absolute concept of validity.

[1] The remark on the Darwinian hypothesis is inspired by Norman Kemp Smith—although of course he is not to be held in any degree responsible for the application. So far as I can see the truth involved is not materially affected by H. de Vries's significant but narrowly directed modification of the Darwinian hypothesis.

[2] It is true that Hegel cannot fairly be accused of any want of vigor in enforcing the distinction of the scientific and the non-scientific or of truth and falsehood as based on these. The difficulty is in rendering the distinction, as formulated, effective in an epistemological sense.

If, however, after all has been said, it is thought that a large proportion of what we ordinarily, and not without reason, consider knowledge is bound to escape the limits of such a narrow and categorical formulation, the following suggestion is offered as in some degree meeting the spiritual demands of the situation. There are large and indefinite provinces of experience and thought, chiefly between the actual and the ideal, where we move with the same assurance and sense of significance which we feel in the case of perfectly accredited knowledge. And yet it is just here that the validity of our assumption in any exact epistemological sense is most difficult to establish. If this is so, however, the proper course, it is urged, is not to throw over the idea of such a criterion and to obscure the problem of knowledge as such with extraneous considerations, pragmatic or other, but to acknowledge that there are convictions and forms of insight which may be of the deepest significance, and yet for which we cannot strictly claim the character of knowledge. Knowledge and meaning are not necessarily co-terminous, and meaning does not necessarily disappear because knowledge is impossible. In some cases, there is reason to think, such meaning is proleptic in its force, anticipating and symbolizing results which knowledge may yet make good. From the practical point of view too it is important that we should not mistake the character and extent of our spiritual accomplishments. Great as is the dynamic value of the positive element involved in the 'als ob' attitude, it must not be forgotten that the 'als ob' rests upon an acknowledgment of limitation, and that such self-conscious limitation must necessarily enter as a constituent into the quality of the resulting activity.

The separation of meaning and knowledge cannot, however, be carried too far. And just as in experience, whenever experience is found, there must be somewhere an element of knowledge, so, we may say, the very fact of meaning is symptomatic of knowledge somewhere. This it may be possible to analyze out of the meaning, as it is possible by elimination to isolate the element of knowledge in even an obscure and unintelligible experience. But apart from such a possibility the significant complex in itself

may frequently in such cases be characterized with entire accuracy, if not as knowledge, at least as *cognitive value*. Too great stress cannot be laid upon this idea, which deserves to be worked out exactly in connection with the problem of knowledge. Outside the realm of our knowledge, if this be strictly determined, there exist innumerable judgments, convictions, views, which, whether containing the germ of knowledge or not, possess its reaction value and a validity of their own, as well-assured at least as the validity of many unchallenged ethical and aesthetic judgments.

A possibility that deserves to be considered is that judgments of the sort may really in the end belong to a category of knowledge which has not been formulated. Scientific character they probably cannot have. But a place has been found for the non-scientific within the concept of knowledge; and we may ask: If there is room in knowledge for the distinction of the scientific and the non-scientific, might not the latter in turn prove itself capable of including certain clearly determinable distinctions which would stand for categories of knowledge? These categories would of course be in the nature of a general set of conditions or universes of discourse, in the sense of general conceptual determinations under which different types of epistemological validity might be secured. For instance, nothing is at present more difficult than to find an exact epistemological designation for the practical insight which is capable of such a high degree of development but is devoid of definite scientific character. In this province the *practical* validity of judgments is far in excess of their capacity for theoretical authentication. Perhaps it is the consciousness of this disproportion that in the end lies at the bottom of all attempts to seek an extra-epistemological criterion for knowledge. The difficulty may, however, really be that the correct category which would render a strict epistemological characterization possible has not been found. There may be a way, for instance, of formulating the proximate judgments of experience in relation to the general concept of practical purpose, which would satisfy not only the practical but the theoretical conditions of knowability. And similarly

with the larger judgments that deal with ultimate value and truth.

When we speak of the reaction value of such judgments, at any rate, it must not be supposed that the reference is only or mainly to their pragmatic importance. The value referred to is strictly epistemological, or at least it contains a strictly epistemological component. As already indicated, there are many phases of reality—the realm of spiritual and moral relationships, of the social and religious life, of the ultimate judgments and largest generalizations of experience—where the deepest certainty is inextricably interfused with the profoundest obscurity. The Platonic myths, explicitly combining the sense of a necessity somewhere with the sense of unsolved enigma, are perhaps the most self-conscious literary expression of this phase of truth.[1]

In view of our general position the following would seem in some measure to indicate the lines on which an explanation would proceed. In the two limiting cases chiefly dealt with, it was required on the one hand to relinquish certain elements of ideal qualification in order to maintain the integrity of a presentational whole, on the other to relinquish a supposed presentational equivalent for the sake of completeness in the ideal qualification. Here, in contradistinction to both cases, we find a significant content too ideal for presentation in any known type of sense equivalent, and at the same time not of the kind which, as in the case of mathematical entities, compensates in exactitude for the loss of presentational character. Elimination must therefore, as in the advance from empirical generalization to better grounded truth, proceed from both extremes—the two opposite dangers, in the case of religion, for example, being anthropomorphism and nature-worship at the one end and theology at the other. The question will be asked whether this double elimination leaves anything knowable standing; to which the

[1] Cf., e. g., Socrates's words at the end of the myth in the *Phædo*: *τὸ μὲν οὖν ταῦτα διισχυρίσασθαι οὕτως ἔχειν, ὡς ἐγὼ διελήλυθα, οὐ πρέπει νοῦν ἔχοντι ἀνδρί· ὅτι μέντοι ἢ ταῦτ' ἐστὶν ἢ τοιαῦτ' ἄττα περὶ τὰς ψυχὰς ἡμῶν καὶ τὰς οἰκήσεις, ἐπείπερ ἀθάνατόν γε ἡ ψυχὴ φαίνεται οὖσα, τοῦτο καὶ πρέπειν μοι δοκεῖ καὶ ἄξιον κινδυνεῦσαι ὁμολογῶ σῦτως ἔχειν· καλὸς γὰρ ὁ κίνδυνος· καὶ χρὴ τὰ τοιαῦτα ὥσπερ ἐπῳδεῖν ἑαυτῷ, διὸ δὴ ἔγωγε καὶ πάλαι μηκύνω τὸν μῦθον.*

answer is: (1) that there must be knowledge of some sort involved if we know that the elimination is necessary, and (2) that the element of meaning remains a genuinely significant factor in our spiritual lives, not exhausted by any practical import it may contain, and sustained by something which, although it wants the presentational factor, we are bound to designate experience. Here then there seems to open up the possibility of establishing the equivalence which we have made a crucial condition of knowledge. In place of the ideal character of mathematical relations we have the ideal character implied in spiritual norms, and in place of the presentational equivalent we have a possible equivalent in an experience of a different order. We refrain, however, from designating as knowledge the knowability implied in this, confining ourselves to the term 'cognitive value' —and for the following two reasons.

First, it seems a warrantable assumption that the sum-total of what we generally claim as knowledge is much in excess of what a strict examination would authenticate. It is sound policy therefore to restrict rather than to enlarge the conditions under which we admit the claim of judgments to validity. In the second place, it is not clear that even in the experience which we call spiritual in order to distinguish it from the experience of sense, there ever is the equivalence of elements which we find in a presentation or in a mathematical demonstration. Our spiritual experiences may contain a *reference* to realities beyond themselves: it is doubtful whether we can so determine the actuality of the spiritual situation as to say that it *means* the latter. The relation here is analogous to a relation which, in narrowing down the conditions of knowledge, we have viewed chiefly on its negative side—that, viz., between the sphere of actual sense experience as a whole and mathematical truth. In order to determine the exact amount of knowledge to be expected from both of these it was found necessary to hold them apart. But there is a positive side to their relationship as well. Although the ideal character of mathematical truth cannot enter into the content of the sense object as actually presented, the latter undoubtedly contains a *reference* to the former, just as the

former is able to employ the latter as a symbolism or notation. It is in the sphere of such relationships that we meet with cognitive values; and they entitle us, as Plato realized, to the almost indefinite use of symbolism. The reservations which Plato constantly makes with respect to the literal acceptation of particulars in the imagery of his myths may be regarded as an application of the principle of elimination.

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A FAITH PHILOSOPHER OF THE EIGHTEENTH CENTURY.

ALTHOUGH for some years now it has been proper and safe to refer to 'present philosophical tendencies' without further characterization, it is well to remind ourselves at times that these tendencies have been present before, roused by conditions in the past similar to those which have to-day produced our philosophies of revolt, anti-intellectualism, super-naturalism and neo-realism. Even in the eighteenth century, age of reason though it was, are to be heard here and there voices raised in protest against monism, naturalism, rationalism, atheism, against all the interpretations of life which seem to ignore its instinctive values and to threaten its belief in the significance of the personal will. There is the same uneasy jealousy of reason, the same trust in instinctive beliefs, the same eagerness for the real, the same preaching of faith, the same delight in emotion, the same love of the individual and, for the most part, the same disinclination for precise definition. Then, as now, the man cursed with the combination of vigorous vitality and acute logic shrank from his threatened submergence in the ocean of the Absolute and voiced his deep distrust of the philosophic method that would thus deprive him of his identity. It was the protest of the man of action and feeling against the theory of the man of thought, and then, as now, it found ready response among the men of common sense whose voice it was. It is true there was no William James to bait the intellectuals, but there was a Friedrich Heinrich Jacobi to test their philosophic patience.

Separated by a century, as were these two men, and different as they were in certain external respects, there were yet points of fundamental likeness between them. Neither was a systematically constructive thinker; but for both there were certain fixed beliefs passionately held and defended through life against all comers, beliefs not so much the result of their philosophizing as determinative of it. Both were non-academic in their type

of thought and impatient of the philosophy of the schools, Jacobi, indeed, never having held a university position and retaining throughout life the free mobility of the amateur. Both were men not merely of religious temper but with critical insight into the implications of religion and the ability to estimate truly the worth of its professed philosophic defenses. As James in our own times worked for the divorce of absolutism and religion, so Jacobi in the closing decades of the eighteenth century and the opening years of the nineteenth, labored to expose the religious insignificance of the changing forms of the idealism of his day and to substitute faith for knowledge. The God of Spinoza was for him no God, the faith of Kant seemed without foundation, and the absolutism of Fichte only an inverted and more consistent Spinozism. A system which found no place in the world for freedom and purpose was for Jacobi atheistic, whatever might be the honorary title granted to its fundamental reality. Natural forces command no moral respect and a universe without purpose is no possible object of worship. That a religious view of the world, however, can be attained by the logical processes of the understanding, Jacobi profoundly disbelieves. "It is the interest of science that there be no God."[1] Between the natural and spiritual worlds there is a great gulf fixed, not to be bridged by logical demonstration, but to be crossed only by the *salto mortale* of him who wills to believe in the ideals which constitute his moral life. Were it not for his perfervid rhetoric one might almost seem to hear the voice of James in these passionate appeals of his Latinized namesake, pleading in the age of enlightenment for the legitimacy of belief.

But there are kinds of faith philosophers, and to define as clearly as possible Jacobi's view of the nature and grounds of his faith is the object of this paper. The task is not altogether an easy one in spite of the limited range of his thought, for his works have the characteristics of polemical orations, and his idea clothes itself in changing forms of expression determined by the successive controversies of his literary life. He learned from every opponent, and it is not till his last preface that he realizes

[1] *Werke*, III, 384.

clearly the position for which he has fought. It will be necessary therefore to look briefly at his life and writings before attempting to formulate his beliefs.

Jacobi was born in 1743 at Düsseldorf, at a time when Count Zinzendorf was organizing the *Herrnhüter* and giving new life to the pietistic movement. His mother died soon after his birth and he was brought up under the care of a pious maid servant who fostered in him from the first her own emotional type of religion, so that it was but natural that he should early attach himself to a pietistic sect known as *die Feinen*. But though these early religious experiences were determinative of his life mood, Jacobi was not a thoughtless enthusiast: he was even in his boyhood passionately interested in philosophy, though apparently, in the judgment of his instructors, unfitted for its pursuit. Even as early as this his realistic predisposition seems to have asserted itself, for he could make nothing of purely abstract concepts, everything must be reducible to the concrete and evaluated in terms of the real. He says of himself, "So long as I can remember it has been characteristic of me that I could make use of no concept whose outer or inner object was not perceptible through sensation or feeling."[1] Such an insistence upon philosophic cash necessarily made his progress slow and his future doubtful in the eyes of those who were accustomed to do a large business upon a conceptual credit basis. Fortunately he was not discouraged permanently, for, his father recognizing his uselessness in business, wisely allowed him to go to Geneva when seventeen years old, and pursue his studies there.

Already dissatisfied with the prevailing eclectic rationalism of Germany, two years of study in Geneva devoted almost exclusively to the French, and probably to the English, sensationalists, served to deepen Jacobi's conviction that the only method for the attainment of truth in either science or religion was the empirical. Both nature and the supernatural presented themselves immediately in experience and the facts of both worlds must in first instance be given through perception. Relations of ideas may be capable of demonstration, but not so matters of

[1] *Werke*, II, 178.

fact. But while Jacobi was a pretty thoroughly convinced empiricist before he was out of his teens, it was not until he came in contact with Kant's writings that he became wholly clear as to the grounds of the rationalistic position and his own relation to it. The year of his return to Germany, 1763, was the year of the Berlin Academy's prize contest on the evidence of metaphysical knowledge. Mendelssohn's successful essay roused his wonder that so celebrated a man could be contented with the old rationalistic proofs of the existence of God, and he was so much the more delighted with Kant's rejected paper which gave him his first clue to what he calls his own "*Ungelehrigkeit.*"[1] A thorough study of Spinoza revealed to him more fully the possibilities and limitations of the rationalistic position, or, as he puts it, "for what God 'the Cartesian proof' is valid and for what it is not."[2] About this same time the reading of Kant's "Einzig mögliche Beweisgrund" produced such joyful palpitation of the heart that he had to interrupt himself several times to secure the calmness necessary for attention.

It was a dozen years before he published his first works, his philosophical romances, *Waldemar* and *Allwill's Briefsammlung*, for his progress was slow. As he says himself, "I needed weeks where others needed only hours; months where they needed days, and years where they needed but months."[3] He was a great reader and his works are filled with citations from both ancient and modern philosophy as well as from the scholastics. Of the moderns he was most careful to define his position relative to Leibniz, whose spiritualistic individualism he shares, but he was also familiar with even the minor writers, especially the moralists, in England and Scotland. Just when he came to know Reid's work is uncertain but it was probably after his own realistic theory of knowledge had begun to take shape.

Aside from his philosophical romances which, while characteristic, are also extremely tedious and inconclusive, Jacobi's first notable work was his *Ueber die Lehre des Spinoza*, first published in 1785, revised and enlarged in 1789. It was this work which roused the controversy that called forth his next book, *David*

[1] *Werke*, p. 184. [2] *Ibid.*, p. 188. [3] *Ibid.*, p. 192.

Hume über den Glauben, oder Idealismus und Realismus, and started him on the controversial career which ended only with his death. And it is as a critic and controversialist, almost as a sceptic, that Jacobi is best and rightly known. Spinoza, Kant, Fichte, Schelling are in turn the objects of his attack and though his interpretation of their doctrine is not infallible, there are few of the classic criticisms of their systems which he does not bring forward. His own offering is, as he often calls it, a *Nichts-Philosophie*, an appeal from the court of the reflective understanding to the moral instincts of a sound human nature.

The occasion of this first work was a bit of philosophic gossip, the carrying of the report to Mendelssohn that Jacobi had said that Lessing was a Spinozist. As Mendelssohn was preparing a memorial of Lessing and had no suspicion that he had held such opinions, he took the liberty of doubting the significance of Jacobi's assertion, and implied that the latter had failed to understand Spinoza's real doctrine. Jacobi's defence of his statement took the form not only of a detailed report of his own conversations with Lessing but of an exposition of Spinozism and its implications. He states the significance of his work in a preface written just before his death: "My *Briefe über die Lehre des Spinoza* were not written in order to refute one system by another, but to show the invincibility of Spinozism from the side of the logical understanding and to prove that the procedure by which the end of this science was attained, *i. e.*, that there was no God, was logically correct. It was not to be refuted upon logical grounds. Spinozism is atheism."[1] Jacobi is perfectly ready to admit that Spinozism "denies, not so much the existence of a God, as the existence of an actual and real world," but this he holds to be a mere matter of words. What is significant for him is that there is no distinction between God and the world and that instead of a free, purposeful creation Spinoza gives us only a "self-subsisting Nature producing out of its own womb, without will, an infinity of phenomena without beginning and without end"[2]—a mere fertility, to use the words of Kant. But "the presupposition of an unconditioned, an undetermined,

[1] *Werke*, IV′, p. xxxvii.

[2] *Ibid.*, p. xxxiv

whole and the presupposition of God are far from the same, and we attain to one or the other by wholly different ways." If we insist upon satisfying a purely theoretical interest in explanation and deducing everything from its logical ground, seeing the one in the many, there is no other solution than that of Spinoza: his ἓν καὶ πᾶν is the last word of a consistent theoretical philosophy. The thirst for explanation will be satisfied by nothing less than this geometrically conceived universe in which all the parts are as necessarily determined as the characteristics of a triangle. A God whose relation to the world is not determinable, a finite individual whose deeds are not the necessary results of the deeds of other finite individuals, a life whose end is not within the sphere open to knowledge—these are facts for which there can be no place in the world as ideally constructed for thought. A world in which such facts had place would be an indeterminate world, a world of miracle, a world where the supernatural might at any time intrude upon the natural and set at naught the demonstrations of knowledge: it would, in short, be a world only to a limited extent knowable and not the tractable world of an all knowing philosophy.

So appreciative was Jacobi's exposition of Spinozism in his conversation with Lessing that the latter was prepared to find him in agreement with his own confession of faith, but such was far from Jacobi's thought. "I believe in an intelligent, personal Cause of the world,"[1] was his creed. He was first and always a theist and it is not the least of his virtues that he at all times consistently refused to accept a stone, no matter how cunningly painted, for bread. He was perfectly clear as to what he, as a religious and moral man, demanded of the universe, and if the universe failed to offer satisfaction to these demands Jacobi had no intention of deceiving himself into a false contentment with the situation. It might be that the intellect could find nothing but an eternally complete world in which nothing happened and nothing was out of place; but if so, the intellect was thereby convicted of incompetence, for there was a world of values incapable of inclusion in this logically adequate scheme, with which the head might be satisfied but never the heart.

[1] *Werke*, p. 59.

To Lessing's astonishment, therefore, as well as to that of Mendelssohn later, Jacobi appeals from the head to the heart and asserts the legitimacy and supremacy of faith (*Glaube*): realities whose existence the intellect cannot prove may, and must, be acceptable upon the evidence of feeling. It was to support this assertion and to justify his use of the term faith against the outcries of his critics accusing him of an appeal to authority, that he published the most significant and carefully reasoned of his works, *David Hume über den Glauben*, in which he cites the testimony of the Scotch sceptic, certainly unprejudiced in favor of authority, that belief or faith is the basis both of knowledge and action. Such belief is not 'blind' in the sense of being an uncritical acceptance of authority but only as not resting upon more ultimate grounds. Our acceptance of an external world is of this character, as Jacobi shows by liberal quotations from Hume's *Enquiry:* "It seems evident, that men are carried by a natural instinct or preposesssion to repose faith in their senses; and that, without any reasoning, or even almost before the use of reason, we always suppose an external universe, which depends not on our perception, but would exist though we and every sensible creature were absent or annihilated."[1] "It follows, therefore, that the difference between fiction and belief lies in some sentiment or feeling, which is annexed to the latter, not to the former and which depends not on the will, nor can be commanded at pleasure." "Belief is nothing but a more vivid, lively, forcible, firm, steady conception of an object, than what the imagination is ever able to attain." "And in philosophy we can go no farther than assert that belief is something felt by the mind, which distinguishes the ideas of the judgment from the fictions of the imagination. It gives them more weight and influence; makes them appear of greater importance, inforces them in the mind; and renders them the governing principle of our actions."[2]

In this empiricism and scepticism of Hume, Jacobi finds strong support. If the reality of even the external world is beyond proof and guaranteed only by this instinctive feeling,

[1] Hume's *Enquiry*, Sect. XII. [2] *Ibid.*, Sect. V.

why should one expect that such supersensible realities as God and a free will should be capable of proof? What more fitting phrase can we use for our attitude toward these than to say that they are objects of belief? Indeed, are we not also justified in speaking of them as "revelations" and even as "miraculous revelations" (*wunderbare Offenbarungen*), since we have no proof of their reality save their actual presence to us, the possibility of which we seem in no natural manner able to explain?

It is in this same work, and as a development of Hume's doctrine of belief, that Jacobi propounds his theory of natural realism, another of his foreshadowings of present day tendencies. It is true that his formulation of the theory is not wholly unambiguous, but the same might be said without fear of contradiction of the formulas of some of our neo-realists. Nor is his elaboration of details and consideration of objections adequate, but in spite of these defects he has a masterly grasp of the general logic of the situation and a sure feeling for the issues involved. If we are to have an independent world of things these must be given us immediately and not representatively through mental states. We must be brought face to face with them and know them in their crude, extra-ideal nature. If we begin with ideas we end with ideas and our knowledge is a play with subjective symbols. But a passionate lover of reality and life like Jacobi will not have it so. He will not be shut in with himself and his ideas; he must transcend himself and gain contact with a world not dependent upon his perception for either its existence or its nature. How it is possible for things to enter consciousness and be immediately known, Jacobi cannot explain, it is a miracle, but that they are thus present to us is one of his fundamental articles of faith.

While Jacobi preaches vigorously his doctrine of realism in this early work it is only with the publication of Kant's critical philosophy that his thought takes on more precise definition. With Kant's ultimate aim, the discrediting of the rationalistic metaphysics and theology of the day in the interest of a practical faith, Jacobi was naturally in hearty accord, seeing, indeed, in Kant's work in this direction his highest claim to distinction.

Never again, since the publication of the *Critique of Pure Reason*, ought one to be imposed upon by the pretensions of the understanding to the attainment of a knowledge of the supersensible and eternal. Once and for all it had been shown that knowledge, strictly so called, is limited to the world of sense perception. About this world, which we call nature, we can make universal and necessary statements which in systematic form constitute our sciences, but about God, freedom and immortality, objects not perceptible by the senses, we can have no knowledge either as to their reality or non-reality.

But with Kant's half hearted idealism Jacobi is far from satisfied, as he indicates in an appendix to his *David Hume*, entitled *Ueber den Transcendentalen Idealismus*, and also in a general introduction to his writings contained in the second volume of his collected works. Of the essential subjectivity of the Kantian philosophy Jacobi was perfectly assured. His own realism stands out most distinctly in contrast with the presupposition which he finds to be the cardinal principle of such subjective systems. "At the basis of all idealism there lies the argument that the matter of our ideas can only be sensation, a modification of ourselves, since it is quite impossible that independent objects existing outside us should move into the soul through eye, ear and feeling hand, like furniture into a room, or that their qualities should walk over into our faculty of ideas."[1] And again he writes that Kant's teaching is "that man receives through his senses only ideas which *may* indeed be related to objects independent of these ideas and really present, but which contain absolutely nothing of the objects themselves independent of the ideas."[2] Such a doctrine as this is a denial of the fact of real perception and a final restriction of knowledge to the field of consciousness.[3]

That in spite of this subjective starting point Kant should still assume the reality of independent things as causes of our

[1] II, p. 39.

[2] *Ibid.*, p. 34.

[3] It is interesting to compare Jacobi's whole critique of the Kantian philosophy with the corresponding attitude of the new realists as in Perry's *Present Philosophical Tendencies*, chs. vi and vii.

experience, introduced into the heart of his system an amazing contradiction which Jacobi was the earliest to point out, formulating it in his epigrammatic confession that "without the presupposition [of things in themselves affecting the senses] I could not enter the system and with that presupposition I could not stay in it."[1] For him the only consistent Kantianism must be a subjective idealism, and he hailed Fichte as the true Messiah of philosophy, of which Kant was only the Baptist.

It is this idealism, however, which, as Jacobi sees it, cuts the ground from under Kant's practical faith. If it is denied that sense perception reveals an independent world and our instinctive trust in the senses is thus discredited, it becomes impossible to put implicit faith in the intuitions of the reason revealing God, freedom and immortality. These, too, become subjective and we lose all contact with an other than ourselves, either physical or supersensible. And since *ohne Du, kein Ich*, with the dissolving of the not-self, the self also vanishes and we are left with an absolute *Nichts*. Such a nihilism he believes to be the only logical outcome of Fichte's absolute subjectivity, as of every non-dualistic philosophy, and to all such he opposes passionately his own doctrine, as he calls it, of absolute objectivity. The glory of man is not in his independence and self completeness, but in his relation to an other, and his supreme faculty is not that of logical reasoning but of vision.

The consequences of the new idealism and the necessity for a dualistic faith philosophy, Jacobi expounds in his open "Letter to Fichte" and his rather rambling discourse "On Divine Things and Their Revelation," contained in the third volume of his works. Turning from these controversial writings, however, which mark no new development of his thought, and attempting to formulate his doctrine of faith, we find three questions which it is necessary to ask concerning it. What are the objects of faith? What is the faith process? What is the nature of the certainty of faith?

We are apt to think of faith as a religious act directed upon the fundamental realities of the spiritual life, but, as we have

[1] II, p. 304.

seen, Jacobi refuses so to narrow its sphere. It is true that his faith philosophy began in his religious experience, in his attempt to understand his "innate worship of an unknown God," but his inquiry soon convinced him that the principle of faith involved in religion underlay the whole of life. "All reality, both the physical which reveals itself through the senses, and the spiritual which reveals itself through the reason, is certified (*bewährt*) to man by feeling; there is no other assurance beyond or above this." We 'believe' the existence of the table as we do the reality of God. Faith is the only means by which we can pass outside the circle of our own consciousness and lay hold upon a reality other than ourselves—indeed, even our own free personality is an object of faith, not knowledge. For, as Jacobi had come to learn from the idealists, we can know only that which we can construct according to concepts, that whose existence we can see arise in thought, and a reality not a thought reality but a real reality can therefore never be known. The real forever eludes thought. It must be given, revealed, received by faith, whether it be a table, a man, or a God.

The terms in which Jacobi comes to formulate the process and place of faith in life, are taken in later years from Kant. They were useful for some aspects of his thought but introduce confusion when applied to others. In his earlier writings he had conceived of knowledge as involving sense (*Sinn*) by which the data were given, and understanding (*Verstand* or *Vernunft*) by which these data were worked over into systematic concepts. But by these two faculties alone we can attain only a science of the natural world, since reason cannot invent new truth but must depend upon the data given it, and sense cannot transcend the physical world. And, in truth, even a knowledge of a real physical world is not possible through sense alone which can only present us with subjective sensations. Accordingly, Jacobi insists that in addition to these traditional faculties we must have a faculty of faith or feeling (*Glaubenskraft or Vermögen des Gefühls*) by which we both perceive the real physical object in and through its appearance to the senses, and also apprehend the existence of realities not visible to sense. Through the senses

I have a presentation of a table but only through feeling do I apprehend its objective existence.

A study of Kant's work causes him to alter his terminology as well as his conception somewhat. He now distinguishes between *Verstand* and *Vernunft*, limiting the former term to the faculty of discursive thought, and applying the latter to the sense of the supersensible. This gives him two intuitive faculties, sense for the physical world and reason for the supersensible world. These furnish the two orders of data from which the understanding constructs its knowledge of the two worlds. Kant had denied our possession of this intuitive reason while retaining his faith in the supersensible world, but Jacobi insists that without such an organ of spiritual vision the soul is incapable of apprehending truth. This higher world must come to us, must make its presence known, and the organ to which it appeals is the reason. "In true Platonic fashion I ascribe to the reason of every created being receptivity and spontaneity, as faculty of perception and apprehension, of finding and holding fast, which together are the original sources of rational truth. In every finite or sense being (for every finite being is necessarily a sense being) the reason is nothing but the sense for the supersensible. As the bodily sense is wholly positive and revealing, so also is the spiritual sense, the reason."[1] Our acceptance of the data from these two sources and the unreasoned assertion of their objectivity would seem to be what is meant by faith or *Glaube*, belief at first hand.

There are, however, some uncertainties and difficulties with this conception of faith and its relation to reason which Jacobi does not successfully remove. Reason is coordinate with sense, as intuitive of objects, and yet he also makes it the power by which even the objective reality of sense objects is known, the sole reality sense, which sees, not merely sense qualities, but the being or substance of them. This relation, as in the Platonic philosophy, remains vague.

Again, faith sometimes figures as a reaction to these presentations from these two sources or a feeling evoked by them, and

[1] III, 435.

sometimes as itself the rational faculty through which the presentations come. In *David Hume* that writer's analysis of belief as a peculiar feeling is accepted, but in his later works it is identified with reason itself. His uncertainties on this point illustrate well the prevalent haziness at that time of the psychology of volition.

Call it faith or call it reason, however, more serious for his theory is his failure to make clear just what this 'sense for the supersensible' reveals and how it works. In the first place, he is sure, at least, that faith is not a mere matter of desperation—the blind assertion of an Absolute even though reflection seems to reveal only its absence. It is not a blind leap in the dark. Neither is it the expression of a longing for a Supreme Being which presents it to the reason ideally rather than as a reality. The Absolute is not a creation of our desires. On the contrary, the desire for an object presupposes an experience of it and unless God were known he could not be sought. There must therefore lie at the root of our longing some perception of the spiritual reality we seek. Jacobi is not clear as to the character of this perception. In particular he fails to explain whether he conceives it as psychologically simple and without a history, an innate idea in the cruder sense of the term, or whether he regards it as only logically ultimate and without further ground. Following the analogy with the physical senses, it would seem as if there should be discoverable in experience some distinct data assignable to the supersensible from which our completed idea of it has arisen, but such elements seem not to be found. Instead it seems as if our whole conception of this higher world were formed of elements sensuous in origin and only metaphorically applicable to this other realm. Jacobi feels the difficulty here and expresses his sympathy with mysticism. "What higher or deeper thought," he asks, "whether intellectual or moral does not border on mysticism?"[1] The beginning of all our knowledge, the presupposition of a Being embracing in Himself the true, the good and the beautiful, is mystical and mysterious, yet necessary. Here therefore Jacobi forsakes the purely intel-

[1] III, 438.

lectual and takes refuge in the purely instinctive and the vague. If we confine ourselves to the clearly conscious in our experience we shall find no support for our faith, for its objects are given neither in perceptions nor in concepts. But, and here he falls back upon Fries in his *Neue Kritik der Vernunft*, this division of knowledge into perception and concept holds only of our consciousness of our knowledge and not of knowledge itself. There are, besides these clear ideas, "also unclear ideas and to these belong especially the immediate, inexpressible, peculiar knowledge of the reason."[1] The validity of these ideas we can only feel. Any attempt to translate them into sensuous forms or intellectual concepts can result only either in *Schwärmerei* or in logical formalism.

This seems to be Jacobi's final word as to the rational intuition upon which he rests the whole of his religious faith. This vision of God, in which he believes, reduces itself in last analysis to a vague experience of intense emotional value. In particular, there seems nothing in it to justify its characterization as a sense for the supersensible and an organ for the immediate apprehension of spiritual realities.

The question as to the certainty of faith has been partly answered in the preceding discussion. Here, too, Jacobi wavers. Generally his assertion is that our beliefs are certified by an immediate feeling which admits of no further strengthening. The man who doubts that a table is before him is beyond reach of further argument; he either has the reality feeling or he has not, and that is the end of it. So it should be that a man either has or has not the felt conviction of the presence of God or of his own freedom, and with that the matter be settled. But Jacobi is not content to rest the question on immediate feeling alone, or, at least, upon any single feeling. The issue involved in the existence of God seems too great to rest for its evidence upon the same simple feeling of certainty which guarantees the reality of a sense object. It is not a question of a mere isolated individual object but of a whole world of moral and social values, which depends upon the assumption of freedom and a personal God.

[1] *Neue Kritik*, I, p. 204.

If man is not free to resist the naturally stronger impulses toward evil, virtue is impossible and our reverence for personality a folly. How freedom is possible and why it is not always exercised in the interest of the good is a mystery, but the fact of it is the heart of the moral life. And so of God: if a personal will is not the cause of things, personality cannot be found in the effects, and we are reduced to a mechanical world in which our morality is an accident, without support or comfort for the future. Our whole moral being cries out for these realities and will not be refused. It is true that in one passage Jacobi asserts the dependence of all faith upon this religious feeling as its source, but this is a genetic relation rather than a logical one. Our particular beliefs grow out of our religious feelings, but their surety for us is not in the primitive feelings from which they arise but in the world of ideal values which they support. These ideals we will have and if these mean freedom and God, these too must be. These derivative values are also values for feeling, according to Jacobi, but the kind of certainty they give is far from the immediate feeling upon which he at first seemed to base them. Certainly this conclusion brings him very near the Kantian and Fichtean conception of practical faith and far from his own formal theory of the priority of the rational intuition.

A summary of Jacobi's philosophy would be as impossible as useless. His writings are the expression of his lifelong struggle to understand himself and to justify his beliefs to the world. His own words form the best characterization of his work. "It was never my intention to set up a system for the schools: my writings proceeded out of my innermost life, they produced historic consequences. I produced them not so much myself as induced by a higher, irresistible power. If thinking and writing of this kind is personal, then my philosophy is essentially personal, but so is that of all whose philosophy is a religion; who seek not for truth in general—an absurdity, like existence or actuality in general—but for a definite truth, satisfying to both head and heart."[1] It is in this passionate, personal type of philosophizing that he is akin to our present age. He is philosophizing for his

[1] IV, p. xvii.

very soul's life, and the beauty of a neat, logical system makes little appeal before this hot longing for access to reality itself. A personal God has no superiority as an explanation of the world, but He alone makes life worth living, and for men of Jacobi's temperament life must be worth living. In every line that he wrote can be felt his distaste for the theoretical attitude and his hunger to embrace reality in his own being. Realist, individualist, pluralist, empiricist, man of faith, in all save incisiveness of thought and picturesque concreteness of style, he is the William James of the late 18th century. Possessed of an acutely keen critical power, he exposes the weak points of his opponents, but his own appeal is to the emotions and the will rather than to the intellect: his function is to persuade rather than to demonstrate. That his philosophy depended upon what might almost be called temperament he had recognized more or less clearly all through his career, but shortly before his death he confessed almost sadly that he had come to feel this as never before: "No one upon whom the feeling of freedom has not impressed itself as upon me, can be convinced by me. No one who cannot admit personality in my sense of the term, can accept my philosophy, my doctrine is no doctrine for him, I am no man for him."[1]

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[1] IV, p. xxiii.

REVIEWS OF BOOKS.

The Authorship of the Platonic Epistles. By R. HACKFORTH. Manchester, University Press. 1913,—pp. 203. [Price $2.00 net.]

Mr. Hackforth's is, unless I mistake, the first English work in which the authorship of the Platonic Epistles is considered with anything like due fulness. I am glad, therefore, to welcome it as being, in my own opinion, a step, and a long step, in the right direction. But before I allow myself to deal with its contents, there is a criticism I feel bound to pass on the University which has issued it as one of a series of University Publications. In its external appearance the work in the main does credit to the University. The binding and type are alike agreeable, though there are one or two vexatious misprints such as no careful proof-reader should have passed, (*e. g.*, "Philius" for "Phlius," p. 156). But the printing of the necessarily numerous Greek quotations is not such as one has a right to expect in a book issued by a University which is honorably anxious to maintain the high standard set by the presses of her older sisters. For one thing the font of type adopted is of inferior design, and, for another, is not uniform. While most of the letters are inclined at an angle of, I suppose, about 75° to the direction of the lines of printing, the βs and θs are all perpendicular, or nearly so, with a result very unpleasing to the eye. It is still more unfortunate that there is a noticeable blank space before the first and after the last letter of every Greek quotation, so that the impression is given that the pages have been originally set up with blank spaces into which the Greek has been subsequently inserted by an unskillful compositor. Worst of all, there are an unusually large number of ugly errors in the use of the breathings and accents. I have myself noted forty such mistakes and I have not read the book with any special attention to these matters. If the University of Manchester seriously means to produce scholarly work in Greek philology it will have to mend its ways in the matter of Greek accentuation. To pass now to the contents of Mr. Hackforth's work, I regret that in a review specially devoted to Philosophy I cannot deal with the issues it raises as fully as I should have wished, since they are, in the main philological and historical. The *Epistles*, if genuine, throw a welcome light on Plato's biography, and contribute to our knowledge of the transition from the Attic prose style of the

early fourth century to the κοινή of the Macedonian age; they make no serious difference to the interpretation of Plato's philosophy. Hence this notice must be confined in the main to a consideration of the most general issues which Mr. Hackforth's methods and results suggest, to the exclusion of points of linguistic detail.

Mr. Hackforth's results, as summarized in his *Conclusion*, represent a *via media* between the view of Raeder, which I ought to say at once is also my own, that the whole of the 13 letters contained in our Plato MSS., with the exception of the first are genuine, and the now happily all but defunct theory of the nineteenth century athetisers who regarded them all as spurious. Mr. Hackforth holds that five of the letters, 3, 4, 7, 8, 13—all, that is, which are of special interest, with one exception—are genuine, five others, 1, 2, 5, 6, 12, are spurious, and the remaining three 9, 10, 11 "doubtful." These positions he maintains with a little more than the average assurance of a really critical scholar; "unquestionably," "incontestably," "beyond doubt" are expressions which meet the eye very frequently in his pages. Yet I think it by no means "beyond doubt" that his *via media* would prove untenable on more thorough examination. Indeed he has himself provided a great deal of the ammunition by which his position may be attacked. On the linguistic side he has reproduced and added to the evidence which shows that there is nothing whatever in the language of the letters he rejects to afford ground for suspicion. And he must not be surprised, therefore, if some of his readers demur to his confident atheteses until he can produce historical or philosophical objections in their support.

I do not intend to comment here on the evidence collected from others, or put forward for the first time, in defence of the five letters which Mr. Hackforth accepts. It is enough for me to say that I believe the evidence marshalled as he has marshalled it is invincible except to those who will not see. In particular, I congratulate him on the fulness with which he has met the series of, mostly arbitrary. exceptions taken by C. Ritter to *Ep.* 13, the one document in which we see Plato in "undress." When the replies made point by point to Ritter's criticisms have been carefully weighed it becomes quite clear that the German critic has really no better reason for rejecting this interesting letter than a notion that it reveals human weaknesses in Plato's character, and that most of the so-called "weaknesses" have been deduced from misunderstandings of Plato's language, or of the state of facts presupposed in the letter.

As for Mr. Hackforth's own atheteses, however, I wish to suggest

briefly that he would not have indulged in them if he had put the real critical problem raised by the correspondence as a whole clearly before his own mind. That he has failed to do so is sufficiently indicated by the simple fact that he writes habitually as though, in dealing with works ascribed to Plato, the choice lay between authenticity and "forgery." It never seems to occur to him that a work reckoned as Plato's in the Canon of Thrasyllus, but proved by modern criticism to be non-Platonic, need not be in any sense a "forgery." Yet most, at any rate, of the non-Platonic dialogues reckoned as genuine in antiquity are certainly not forgeries in any sense of the word. Some of them, such as the *Minos* and *Hipparchus*, are indubitably the work of Socratic men of the early fourth century, and cannot therefore be "spurious" dialogues of Plato. They are simply Socratic discourses of the Platonic age whose real authors have been forgotten, just as the tract on the Athenian polity preserved in the MSS. of Xenophon is not a "forgery" but an anonymous work of the later fifth century. Even the works which were "universally rejected" by antiquity from the Platonic Canon are not necessarily "forgeries." The *Axiochus* is a case in point. Its style and contents alike prove it to be the work of a Platonist of c. 300 B.C. It is thus non-Platonic, but not in the proper sense of the word "spurious," since it makes no pretense that Plato was its author. The attribution to Plato merely means that the real authorship of that particular Socratic discourse was early forgotten. One may further remark that the very fact that third-century work like the *Axiochus* was "universally rejected" in later antiquity tends to show that the tradition or linguistic sense or both of the students of Plato in later antiquity was fairly sound. That the *Epistles* were not "rejected" shows a correct sense that their style is not that of the third, or a later, century, as indeed Mr. Hackforth admits. Now this, in turn, means that, whoever wrote them, the letters admitted into the Canon, are fourth-century work. The *Axiochus*, again, offers us the means of testing our assertion. It so happens that its contents enable us to date it with absolute certainty to a very few years. It is an Academic work belonging to the years at the very end of the fourth or very beginning of the third century. But in this dialogue, though its writer is clearly a member of Plato's Academy, the style is already totally dissimilar from that of the "later" Platonic dialogues, which is exactly reproduced in the *Epistles*. The same thing may be said of the most important of the *νοθευόμενοι*. It is only because we do not study them that we fall into the error of crediting Alexandrian "forgers" with ability to make colorable

imitations of the highly individual manner of Plato, or even to reproduce his vocabulary. But if the *Epistles* belong to the fourth century at all, the only plausible theory to account for them as "forgeries," the view that they were "faked" for sale to the book-collecting kings of Egypt and Pergamus, vanishes. What I find lacking in Mr. Hackforth's work, then, is the recognition that what we have to deal with is, in the first instance at least, not individual letters, but a correspondence as a whole, a correspondence which exhibits a remarkable unity of style and sentiment. True criticism, bearing in mind that no letters but *the* thirteen stand in the Plato MSS. would begin by asking whether we can say when or how *the* thirteen letters as a unit came into the Platonic Canon. Whether one or other of the thirteen may be spurious is a logically secondary question which cannot be answered until we have learned what we can of the history of the collection as a collection. (So Van Manen rightly objected to the Tübingen criticism of another famous correspondence on the ground that Baur and his followers ought to have started from the fact that the ἐπιστολαὶ Παύλου, as a matter of history, came into the New Testament Canon as a connected whole, and not piece-meal.)

Now we know that "the thirteen" were already included in the Canon of Thrasyllus (who, by the way, was not misled into recognizing even such early third-century work as the *Axiochus*). We know, also, that some of the thirteen are used as Platonic by Cicero, and that certain "Epistles" were regarded as Plato's by Aristophanes of Byzantium. When we bear in mind that no Alexandrian "forger" ever succeeded in writing fourth-century Attic prose, that there are no signs whatever that any "letter of Plato" other than those contained in our MSS. ever stood in a manuscript or was used as Platonic by any writer before the Christian era, then, as it seems to me, we are irresistibly led to the conclusion that the *Epistles* reckoned as one work by Aristophanes were just the thirteen which Thrasyllus also reckoned as one member of a "tetralogy." At least, the *onus probandi* lies with those who impugn the statement. I, at least, see no way of escaping the conclusion that we have probability of the very highest kind for the view that a correspondence consisting of our thirteen letters and no others stood in the texts of Plato kept in the Alexandrian library from the first, and this, taken together with the excellent Platonic style of letters 2–13, convinces me that the attempt to reject some or any of the number must be abandoned. Even the case of the first letter, which it would be hopeless to defend, is not, as Mr. Hackforth assumes, one of "forgery," since there is no evidence

that the writer had any intention of impersonating Plato at all. This is not the place for philological discussion, but I may indicate my own conviction that on stylistic grounds alone, the document must be assigned to the fourth century, and is an absolutely genuine letter from some one who had played an important part in Sicilian history (not necessarily a foreigner, for the writer's designation of the city in which he had figured as "*your* city" may only indicate that he is an exile and technically ἄπολις,) to a ruler of whose conduct he complains. (As has been recently suggested, it would suit the situation in the letter if we supposed it to be written by Philistus to Dionysius I, but the suggestion is no more than a guess, and others could equally well be made.) The fact then will be, in all probability, that the letter was included in the collection of "letters of Plato" from the first, because it bore on the Sicilian troubles, and that nothing is wrong with it except the MSS. heading "Plato to Dionysius." A wrong heading of this kind no more makes the letter a "forgery" than the ascription of the ninetieth Psalm to "Moses the man of God" makes that poem a "forgery."

With regard to the rest of the letters all I can say in a philosophical review is that Mr. Hackforth's case against those he rejects is, in principle, destroyed if my contention that comparison with the νοθευόμενοι among the dialogues shows that the Platonic style could not be successfully imitated, even by Platonists, half-a-century after Plato's death is correct. With the exclusion of supposed motives for forgery the hypothesis of the existence of superhumanly gifted forgers is excluded too. And I will add that the attempts to raise difficulties about small points of language, and to detect "borrowings" from Platonic dialogues, are of no weight. Mr. Hackforth estimates this kind of thing at its true value when he is dealing with objections of the same order brought by the German athetisers against the letters which he defends. What he does not see is that methods of criticism which are puerile when applied to, say, *Ep.* 7 or 13, are equally puerile if brought up against 2 or 6. Not to say that in some cases he is definitely wrong about the facts, as, for example, when he says, as part of his case against 2 that "Plato probably did not use" the word ποίησις in the sense of a "poem." In point of fact the very use in question occurs at *Laws* 829e, as the lexicons note. Though, if Mr. Hackforth had been aware of this, I am not sure that he would not, like athetisers in general, have agreed that the coincidence proves "borrowing."

I may add a further remark with regard to this *Ep.* 2. As every one

knows, it contains the famous "enigma" about the three ἀρχαί, and Mr. Hackforth's great argument against the letter consists in an attempt to prove that this "enigma" has been concocted by a forger who stupidly copied the beginning of the genuine passage about the theory of knowledge in *Ep.* 7 without understanding its meaning. Curiously enough Mr. Hackforth seems to be unaware that any solution of the "enigma" (which, on his theory, is really insoluble because it is nonsense,) had ever been given before that of Raeder, which he rejects. He does not know, then, that the passage is discussed and xpounded by Plotinus (*Enneads* V, 1, 8) and again by Porphyry in the fourth book of his *History of Philosophy* (see the fragment as preserved by Cyril of Alexandria in Nauck's *Porphyrii opuscula selecta*). Plotinus explains, quoting expressly from our letter, that the three "spoken of are (1) the Good, (2) Mind = the Demiurge of the *Timaeus*, (3) the Soul of the World. This is a better solution than Raeder's which, as Mr. Hackforth says, is vitiated by a bad mistranslation. That it is what the writer meant seems obvious to me from the mere consideration that the "first" of the "three" is expressly called the "cause of all good things." In Platonic language this means that the "first" is the "good" of the *Republic*, and with this hint to guide him, a reader of the *Timaeus* can readily divine the rest of the solution. (In fact, until we recollect that the *Timaeus* was probably still unwritten when Plato sent this letter to Dionysius, we might fairly complain that his "puzzle" is no puzzle at all.) Mr. Hackforth's exposition is as unhappy as it is far fetched. He supposes his "forger" to mean by the "three things," Platonic "Idea" (in general), λόγος (the corresponding concept,—"in the mind," I imagine,) and the corresponding name. The "forger" got the idea of speaking of them in this enigmatic way as "first, second, third," from the epistemological passage in *Ep.* 7, where Plato speaks of a "first, second, third," which turn out to be (1) name, (2) corresponding definition or logical concept, (3) εἴδωλον, sensible embodiment of the concept, *e. g.*, a visible geometrical diagram. Thus the "forger" explicitly makes the incredible blunder of mistaking the "third thing" of 7, which is repeatedly described as the εἴδωλον, for a Platonic "Idea," and further makes a second equally bad blunder which Mr. Hackforth overlooks. Even on Mr. Hackforth's assumption the "forger" should have spoken of the "Idea" as the "third thing" and the name as the "first." In point of fact he has precisely reversed the order he is supposed to have got by misunderstanding *Ep.* 7, made the "Idea," which he imagined to be the "third" there referred to, "first" in his imitation, and inciden-

tally also said of "the Idea" (*i. e.* apparently of *any* "Idea") what Plato says exclusively of the "Good," that it is "King of all."[1] If Mr. Hackforth can believe in this complicated series of blunders within blunders, I cannot. The complexity of the supposed process of mental confusion is, to me, of itself proof that the "enigma" of *Ep.* 2 has nothing to do with *Ep.* 7 but is quite correctly connected by Plotinus with the *Timaeus* and the allusion to the first and second gods of *Ep.* 6 (which Mr. Hackforth tries to explain by a very far-fetched disquisition about the *Symposium* and the parentage of Eros, an explanation which leaves the words of *Ep.* 6 as mysterious as they were before). The only further reason of any weight produced against the authenticity of the letter is that "Plato could not" have spoken of his "deepest metaphysical beliefs" in a half-jesting way as a παιδιά. Mr. Hackforth has, of course, to allow that the very same language is used in the *Laws* about Plato's great work on legislation and jurisprudence, but that, he says, "is quite another matter." In my own opinion his comprehension of Plato is still very imperfect if he does not see that Plato is every whit as much in earnest about his social theories as he is about his metaphysics. Moreover, it is not the Platonic metaphysics but the half-mystical expression of his thought in terms of theology which is called in our letter "earnest mingled with play." And this is exactly what the symbolism of the first and second gods is. The doctrine of the "Good" and of God is philosophical earnest, its expression, as for instance in the *Timaeus*, under the image of the Architect and his model is "play." Plato himself warns us of this, only in rather different words, by the explanation prefixed to the cosmogony of the *Timaeus* (29 b–d), that the narrative pretends to be no more than a "tale" something like the truth.

The reasons given for condemning 5 (Plato to Perdiccas) are even more flimsy. The letter, which purports to recommend King Perdiccas to be guided by the counsels of its bearer Euphraeus, contains the very pertinent observation that each different constitution has its own characteristic "note"; the "note" of monarchy, *e. g.*, is different from that of democracy, as the characteristic "note" or "cry" of one animal is different from that of another. Hence a sound political adviser requires to be familiar with the special "note" of the polity to

[1] Ep. 2, 312 e. περὶ τὸν πάντων βασιλέα πάντ' ἐστι καὶ ἐκείνου ἕνεκα πάντα, καὶ ἐκεῖνο αἴτιον ἁπάντων τῶν καλῶν. So Rep. 508 e, the "good" is neither ἀλήθειαν (Real Being) nor knowledge, but the "cause" of both, and (*ib.*, 509 d) it βασιλεύει "is *King* of" the νοητὸν γένος. So in the *Timaeus* (29 a) it is the "model" on which the Demiurge constructs the visible world which is "the cause" of "the most beautiful of things caused."

which his counsels are to be given. A man would be ill-qualified to act as adviser to a Macedonian king if he did not understand how to adapt his counsels to the prime factor in the situation, the fact that the system of the county is monarchical. The observation is as true as it is obvious. Euphraeus would have to bear steadily in mind that measures which might be feasible, for instance, under the Athenian constitution, might be out of the question in Macedonia, (of course there could be no question of sending him to establish a "Platonic republic"; his business would be, like that of the Aristotelian statesman who has to work with a theoretically undesirable constitution, to do the best "under the circumstances"). But it happens that in the *Republic* Plato had spoken of the opportunist demagogue as one who has picked up the knack of interpreting the inarticulate "cries" of the "many-headed beast." So Mr. Hackforth decides that because he had once used the metaphor of the "cry" of an animal, he may never use it again with a different sense, in a different connection, however appropriate and natural the new sense may be. "Plato has no conception of a 'key-note' appropriate to a particular form of government," and the whole passage must be a "clumsy" imitation of the passage in the *Republic*, though the two have nothing in common except the metaphor from the "note" or "cry," and the two wholly different applications of this metaphor are alike natural and obvious. Criticism of this kind is too arbitrary to have any objective value.

The condemnation of 12 (Plato to Archytas) rests on even more fanciful grounds, though in this case the original offender is Zeller, whom Mr. Hackforth merely follows. I should attach little weight to the note in some of our MSS. that "the authorship of the letter is disputed," since we know neither whether the comment was meant to refer to 12 or to 13, nor yet on what grounds the unnamed objectors based their arguments. Zeller's reason for rejection is, in any case, empty. He argues thus: in the life of Archytas by Laertius Diogenes there is a letter which purports to be sent by Archytas to Plato with certain works of the Lucanian Pythagorean Ocellus. This letter and our 12, which Zeller treats as purporting to be Plato's reply, are therefore probably forgeries by the author of the forged treatise of Ocellus, which probably belongs to the middle of the first century before Christ, the object of the fabrication being to claim the testimony of Plato to the authenticity of the work of "Ocellus." The argument is so bad that one can hardly account for Zeller's belief in it except by recollecting that he began life as one of the "Tübingen" critics. The only point of contact between our letter 12 and the pretended letter

of Archytas is that both speak of certain "documents" or "papers" as passing between the friends. The Platonic letter gives no information about the nature of the "papers," and makes no reference to Ocellus. (We have no real warrant for assuming that he is the unnamed "man" whom Plato thought "worthy of his ancestors of long ago.") Further, if the two letters had been the work of the same hand, we might reasonably have expected both to be found in our manuscripts of Plato, and this is not the case. And, finally, it is unreasonable to expect the successful imitation of Platonic prose, even on so small a scale, from a writer who knew no better than to make "Ocellus" express himself in the specific style of an Aristotelian lecture. To me it seems intrinsically much more probable, if there is really any connection between *Ep.* 12 and the supposed letter of Archytas, that the "forger" of "Ocellus" should have been prompted to construct his "covering letter" by the fact that there was an already recognized letter from Plato thanking Archytas for the communication of certain "papers." If the "forger" had himself concocted the letter in Plato's name, it is surely likely that he would have introduced some explicit reference to Ocellus into it. That he did not seems to me to show that his hands were tied by the existence of *Ep.* 12. Accordingly he could only get in the reference to Ocellus by inventing a letter of Archytas to which the already existing Platonic letter might appear to be an answer.

On the whole, then, I submit that the position of Grote and Raeder is really more in accord with sound critical principles than Mr. Hackforth's. In any case he has no right to call his atheteses "incontestable," since none of them rest on solid grounds (I except, of course, the case of *Ep.* 1, though even that, as I have said, is, in my opinion, not "spurious" in Mr. Hackforth's sense). And I would once more urge that no final decision can be reached until the question has been squarely and fairly faced. Does the 'Canon of Thrasyllus' contain any single work of which we can say with probability that it is later than the end of the fourth century? The proper way to examine such a question would be to make a careful comparison of the style and vocabulary of the νοθευόμενοι with those of the certainly non-Platonic dialogues which were placed in the 'Canon.' The nearest approach to such a study with which I am acquainted is the second chapter of Ritter's *Untersuchungen*, and the results given there, so far as they go, tend strongly to suggest that while the νοθευόμενοι almost uniformly betray a later date, the "spurious" small dialogues contained in the "Canon" have no linguistic peculiarities which

would suggest a date later than the end of the fourth century for any of them. If further examination should confirm these results the case for the genuineness of the *Epistles* as a whole would become almost incontestable.

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Development and Purpose; An Essay towards a Philosophy of Evolution. By L. T. Hobhouse. London, Macmillan & Co., 1913.—pp. xxix, 383.

In an illuminating introduction (which might serve, with appropriate modifications of detail, as the spiritual autobiography of many a philosopher who is now in his maturity) Mr. Hobhouse confesses this book to be the outcome of twenty-six years of serious concern with the problems set by the two philosophies which were, in the one case, the outgrowth of the regnant science of his day, and in the other case, the reaction against it,—the philosophy, namely, of materialistic evolutionism, and of "modified Hegelianism, or a form of Kantianism in which what was best in the Hegelian criticism was incorporated." Mr. Hobhouse could find no satisfaction in either philosophy; not in the first because of its tragic consequences for human values; and not in the second because the "attempt to regard reality as all spiritual was as fatal to clear thinking and to the most cherished ideas of the idealist himself as materialism." Besides, idealism failed to make its proper account with science.

Convinced that a philosophy which went counter to science could never justify itself, Mr. Hobhouse accepted the general conception of evolution as the key to his problem. But he realized that if the conception were to be properly applied, the mental and spiritual life must be treated quite dispassionately, without any attempt to minimize differences of kind and transform mental phenomena into physical, as had been the tendency among most proponents of evolution. An unbiased evolutionary treatment of the mental life might prove it to be not simply a function cunningly devised for adapting organisms to their environment, but for developing in organisms increasing control and direction of their world. Consciousness might even turn out "to be the central point in development." "This would imply not that reality is Spiritual or the creation of an unconditioned mind—a view equally repugnant to morality and experience—but that there is a spiritual element integral to the structure and movement of Reality, and that evolution is the process by which this principle makes itself master of the residual conditions which at first dominate its life and

thwart its efforts" (p. xxvi). Mr. Hobhouse's three books, *Theory of Knowledge* (1896), *Mind in Evolution* (1901), and *Morals in Evolution* (1906), were preliminary steps in the furtherance of this plan to work out the thoroughgoing implications of evolution. The present volume completes the plan.

The book is divided into two parts. The first part traces, in accordance with the methods and presuppositions of science, the development of mind from its lowest ascertainable conditions to its highest phases. The second part subjects this entire scientific procedure and result to the test of philosophical principles.

In tracing the evolution and function of consciousness, Mr. Hobhouse finds it necessary to reject 'consciousness' as the basis of his classification and to employ instead a type of activity (correlation) which is wider in extent and recognizable through external behavior. "The term correlation . . . serves, first, as a *summum genus* under which all kinds of vital activity, conscious or unconscious, might be subsumed, and secondly as a standard by which they might be compared" (p. xxiii).

By the employment of such a standard the author is enabled to escape the usual pitfalls that lie in the way of unwary assumptions as to the nature of mind. Throughout his historical descriptive account he holds no brief for any metaphysical theory of mind. He simply describes the different types of correlation processes that exist or have existed.

It is impossible to follow the author through the intricate chapters in which he traces the development of more and more adequate types of correlation. In general the development proceeds through correlations which are wholly limited to co-present conditions and in which there is for the creature as yet no "world" of "things" and "qualities," to correlations in terms of non-present factors. The latter correlations, inasmuch as they import the non-present into the present, constitute a world of resemblances and differences, continuities and discontinuities,—a world, in short, of "things" and "qualities," the "common-sense" world. But the common-sense world, when it first emerges, is full of inconsistencies and incoherencies. Qualities are confused with substances, as in animism and magic; identities are thought to exclude differences, etc. Also it discloses itself as wofully limited: trees and animals and persons seem moved by powers of which there is no clear understanding or control. Inasmuch, now, as the impulse of the correlating organism is to correlate, any factors of non-correlation are so much of stimulus to further adjustment. The

impulse to further correlation therefore takes the form, on the one hand, of a critical turning upon the forms and factors of the world of common sense in order to effect a better understanding and control of them. The outcome of this is the whole course of philosophic and scientific thought. On the other hand, it takes the form of reaching beyond the limited truths of the common-sense world to a world of Higher Reality. Point by point with this conceptual and experiential reconstruction and with this deepening and enlarging of spiritual life, goes an increasing control by the correlating process of the conditions of its existence both in relation to its fellows (morality) and to the world (arts). "Looking through social development as a whole," he concludes, "we observe first the development of an organ of social control and the increasing efficiency of ideas in the organization of life; secondly, the equalization of rights and duties and the consequent destruction of many of the barriers that divide mankind; lastly, the development of the principles of personality. . . . We now see that in social organization on its many sides, though the way is crooked, the final tendency is to realize that free cooperation of humanity which is the condition of a harmonious development. . . . But in tracing the history of mind we are dealing with one cause only—a cause that acts in a *milieu* of complex forces, but acting steadily, if our account is correct, gets the upper hand among them little by little" (p. 226).

Thus far the account has been purely historical. Is the account valid? Are we, in short, for all our history, any nearer to Reality? The author now finds it necessary to remove the typical objections that stand in the way of accepting such empirical data as of value for a determination of reality. There is first subjectivism; then the theory that no knowledge is true knowledge save as it is complete; and finally, the view that all knowing by analysis is a distortion of reality. Disposing of these and assured of the rights of empiricism in the premises, the author proceeds to a careful discussion of the conditions of valid scientific thought. What is noteworthy about this discussion is the clear connection shown between a true theory of knowledge and the concept of development. "The idea of development lies at the very basis of validity itself. . . . The continuity which any ratiocination claims is found to hold good only with this saving clause, that it is understood to yield truth not final and complete but partial and in growth. . . . The wider the basis and the more complete the articulation of thought, the more just is its rendering of reality" (p. 279).

So much for the critical review of the knowing process. But what

of the place of mind in the cosmos? Mind is only one, though indeed a growing factor in evolution. Perhaps there are absolute barriers to its farther expansion; nay, if the energy available is a limited quantity, there may come a time of absolute extinction. The author examines with skill the arguments based upon the law of dissipation of energy and shows conclusively the utter insecurity of their ground. But escape from the fate of extinction, he holds, can be gained only by the proof that mind is a true cause and not an epiphenomenon. The author proceeds accordingly to the fundamental task of his book, the examination of the concept of causality. In the chapter on Mechanism and Teleology, he makes first a careful analysis of the two concepts and proceeds then to ask whether there is empirical evidence of teleological or purposive causality. Such evidence he seems to find in the fact that there are types of action which are selective responses to unique conditions involving the future. The condition of a mechanism on the contrary is that it responds only in typical ways to typical conditions.

The living being then is a system of forces "in which mechanical relations are qualified by teleological relations." We err, however, when we hypostatize these into two substances, Mind and Body, and seek by various devices—parallelism, interactionism—to establish the relations between them. In point of fact "the concept of the mechanical sums up or brings together certain elements of experience; the concept of mind certain other elements. But these elements belong to or qualify realities which act as wholes. . . . The mechanical and the teleological are then modes in which reality operates. At some points reality appears to operate wholly on mechanical lines. At other points, in living beings, the mechanical operations are qualified by teleological factors. At other points, it may be, it acts in teleological ways exclusively. To avoid misunderstanding it should be added that there is no warrant in this statement for the inference that in the living being either the mechanical or the teleological factor is the substance of which the other is the quality. Both factors qualify the total Reality, which in addition may contain many unknown elements" (p. 329).

With the justification of purposive causality, the main task of the book is accomplished. Mind is a true cause; the historical evolution which exhibits the increasing development and control of mind, is as far as it goes a true history of reality, which points to the growing effectiveness of mind in reality. But the account shows mind to be only one factor, not the Creator, nor the Absolute. It is the destiny

of mind to grow in power, to transform a world of more or less mechanical indifference into a world of significant unity. So the argument is brought full circle; and the task of reconciling evolutional science with the fundamental values of purpose and development is brought to a close.

There can be no question that in this latest volume Mr. Hobhouse has performed a philosophical service of high rank. With a comprehensive understanding of an intricate mass of details, he has pointed the way in which philosophy, making its full account with natural science, may yet retain those fundamental values which anti-scientific philosophies had formerly sought to secure by arguments essentially indefensible. The world view to which he leads is in keeping both with the modesty and the high faith of modern science. Evolution is not a word to conjure with in the sense that all is inevitably upward moving. Reality is indeed proved to be fundamentally organic; but the mind process is but one among many processes, one which makes its way slowly and by devious paths to increasing control. In this respect Mr. Hobhouse lends support to the growing attitude of opposition to the Absolutisms. The Good, the Spiritual—God indeed—is a developing, not an eternally existent, reality. A new type of religious attitude is thereby implied, the attitude of devotion to and active support of the growing spiritual life that is in and of the life of the world. One wishes, however, that at the end of his book Mr. Hobhouse had been clearer in his expressions regarding the cosmic character of mind. After elaborating a view which unequivocally showed mind-correlations and therefore purpose to have had their slow development out of correlation-activities which were not yet mental or purposive, Mr. Hobhouse in the last chapters speaks of a World Purpose in a way that brings him dangerously near to the Absolutisms which he apparently rejects. Yet this may be wholly due to unclear expression, for the counter view of a World Soul or World Mind as a type of reality yet to be realized is undoubtedly part of Mr. Hobhouse's thought.

Far-reaching in its philosophical significance is the author's resolution of the body-mind dualism. According to Mr. Hobhouse, mind is simply a type of organic functioning. Mind *is* body; only it is that type of body which has achieved the power to correlate in terms of novel and non-present conditions. The disproof of the body-mind dualism and the resolution of all processes into "correlations," changes the traditional separation of mind and body into a distinction between different types of correlation-activity, types not radically different

but conceivable as continuous with each other in development. With the adoption of the correlation theory of mind goes the denial of the various copy theories of knowledge and in general of all those views, which regard mind as some manner of 'subcutaneous' substance. Yet it must be confessed that with all Mr. Hobhouse's alert suspicion of the substance views of mind, he sometimes falls into expressions which preserve their flavor, as *e. g.* (p. 161): "For the function of thought as a correlating activity is to discover what is already real and the only thing it constructs is its own system *which it means to correspond to the real order*" (italics mine).

One cannot praise too highly the intricate and searching analysis of the concept of causality and the proof that teleology is a fundamental category. On the other hand, one feels that Mr. Hobhouse has not done sufficient justice to the modern movement in the biological and psychological sciences which aims to exclude all teleological methods of explanation. Mr. Hobhouse's analysis would seem to condemn such a movement and to take sides with that other type of dualism which, dividing the world into mechanical and teleological processes, demands that each type of process be dealt with by the method appropriate to its character. Mr. Hobhouse's own arguments however might have led him to support in full the movement for a thoroughly mechanistic science. For if, as he seems to prove, organic unity is "the limit of a mechanical adjustment of interacting parts," the analysis even of organic unity may be made in mechanical terms, *i. e.*, in terms that infinitely approach the limit. Analytic science can do little with "the simultaneity of a consentaneous whole;" it must break up the consentaneity; *i. e.*, it must treat what is not mechanical as mechanical. But in so doing it need not seriously falsify, any more than the calculus falsifies in translating a curve into straight lines. Like the calculus it may reduce the error to an infinitesimal. Hence it is perfectly possible to hold that reality is fundamentally organic and yet believe that the only true method of science is the mechanical. One further word of criticism must be made. One finds in Mr. Hobhouse's sharp distinction between knowledge and practice a partial surrender of his own view of mind as essentially a correlating activity. If mind correlates, it is fundamentally practical. There is then no such sharp distinction between theory and practice as Mr. Hobhouse seems to assume.

May the writer venture, too, the hope that in succeeding editions Mr. Hobhouse will rewrite and amplify the exceedingly crucial pages 345–348, which at present are heart breaking?

Such criticisms however are offered with apology lest they seem to detract unduly from a work which is of such splendid power that it cannot fail of lasting effect upon philosophy.

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Pragmatism and Idealism. By William Caldwell. London, Adam and Charles Black, 1913.—pp. vii, 268.

The main purpose of this book is, in the words of the author, "the estimation of the place of Pragmatism in the constructive thought of the present time" (p. 126). The author does not set out to explain Pragmatism, nor to defend it, nor to controvert it. The time is past, he holds, when books explanatory of Pragmatism are needed; for most thinking people have formed judgments of their own about it. "There are still, however, some things to be said, at least in English, upon the place and the meaning of Pragmatism in the philosophical reconstruction that is generally felt to be so necessary today" (p. 1). The present volume, the product of mature reflection, judicial in tone and well-considered as to conclusion, is itself evidence that the time has come when it begins to be possible to make a fair appraisement of the value of the pragmatist's contribution to philosophy.

There are indications, thinks Professor Caldwell, that Pragmatism has already received its highest theoretical expression (p. 3). It has, he believes, "progressed from the stage of (1) a mere method of discussing truth and thinking in relation to the problem of philosophy as a whole, to (2) that of a more or less definite and detailed criticism of the rationalism that overlooks the practical, or purposive, character of most of our knowledge, to that of (3) a humanistic or 'voluntaristic' or 'personalistic' philosophy, with its many different associations and affiliations" (p. 20). Signs appear "that Pragmatism is perhaps breaking up in America into some of the more elemental tendencies out of which it developed—in this case the American desire for operative (or effective) realism and for a direct contact with reality instead of the indirect contact of so many metaphysical systems" (p. 54).

After an instructive resumé of the phases Pragmatism has assumed in European countries, with a mention of some of the results of the pragmatist movement upon contemporary philosophy, in Chapter II, Professor Caldwell begins the detailed study of his subject. He opens the discussion by a treatment in the following chapter of the three or four more or less characteristic assumptions and contentions upon which the fundamental tendencies of Pragmatism appear to rest.

Four of these assumptions are considered. The first is the position that all truth is "made" truth, "human" truth, truth related to human purposes and attitudes. Despite the self-evident character of this assertion and its wearisome iteration by pragmatists, the author agrees that a consideration of the utility of first principles in explaining our common experience and its realities is the only way of explaining their reality even as conceptions. The second is Pragmatism's insistence that belief is the one thing fundamental to our entire life as men. Only the undue prominence of mathematical and physical science since the time of Descartes has, in the author's opinion, made evidence and demonstration the main consideration of philosophy, instead of belief. The third characteristic assumption of Pragmatism is the "deeper view of human nature" upon which, in contrast to Rationalism, it supposes itself to rest. Here also the author so far agrees as to assert that the affections and emotions "rest in general upon a broader and deeper attitude to reality than does either the perception of the senses or the critical analysis of the understanding" (p. 71). A fourth characteristic of Pragmatism is its notorious "anti-intellectualism." Considered in the light of its results upon contemporary philosophy it has led to a general clearing of the ground, with many striking concessions to common-sense.

The fourth chapter, entitled "Pragmatism and Human Activity," gives us the key to Professor Caldwell's own position—the position which places him in fundamental sympathy if not in complete agreement with Pragmatism while at the same time affording him a standpoint for most effective criticism. It is the outstanding characteristic of Pragmatism that it raises the "great question of the simple fact of human action and of its significance for philosophy" (p. 93). This central fact of action has been relegated to a subordinate place by the rationalism of philosophy and the mechanical philosophy of science. It is the great merit of Pragmatism to have discovered the momentous importance of action. "If action therefore could only be properly understood, if it can somehow be seen in its universal or its cosmic significance, there would be no discrepancy and no gap between the world of our ideals and the world of our thoughts. We would know what we want and desire what we know we can get—the complete development of our personality" (p. 101). Pragmatism has failed, however, to make the most of its justifiable insistence upon action and upon the creative activity of the individual. This failure is due to its neglect of the ideals of personal conduct in its pre-occupation with the process of acting. "Short, however, of a more genuine

attempt on the part of Pragmatism than anything it has as yet given us in this connection to justify this higher reason and truth that are embodied in our consciousness of ourselves as persons, as rational agents, all its mere 'practicalism' and all its 'instrumentalism' are but the workaday and utilitarian philosophy of which we have already complained in its earlier and cruder professions" (p. 108).

The following chapter contains a criticism of Pragmatism that is both searching and satisfactory, since it does not pause to cavil over minor shortcomings but lays bare in a convincing and forcible fashion the fundamental defects in the philosophy under examination. In the first place, the pragmatic criterion of truth is inadequate. It amounts to no more than the harmless doctrine that the meaning of any conception expresses itself in the past present and future conduct, or experiences of actual, or possible, sentient creatures. But if harmless, this doctrine of truth, as it stands, is also useless, since Omniscience alone could bring together in thought all the consequences of an assertion. Secondly, Pragmatism is fatally weak in the realms of logic and theory of knowledge. It has failed to connect its discoveries in genetic logic and in the theory of hypotheses with the traditional body of logical doctrine, or its hints about the practical or experimental origin of most of our points of view about reality with the problem of the validity of first principles generally. In the third place, it has failed to attain to any intelligible or consistent conception of reality. "Now it is just this palpable lack of an 'objective' or rational order that renders the whole pragmatist philosophy liable to the charges of (1) subjectivism, and (2) irrationality, (p. 134). Fourthly, it is unsatisfactory in the realm of Ethics. "And so far as practice is concerned, all that this Pragmatism or 'Relativism' in morals inevitably leads to is the conclusion that whatever brings about a change, or a result, or a 'new formation' or a new 'development' of the moral situation, is necessarily moral, that 'growth' and 'liberation' and 'fruitfulness' and 'experimentation' are everything, and moral scruples and conscience simply nothing" (p. 139).

These errors and inadequacies do not condemn Pragmatism in the opinion of the author; for he believes that it contains tendencies which, if allowed development, will do much to remove them. The tendency which he has chiefly in mind is the humanistic, and this is made the subject of a chapter, "Pragmatism as Humanism." The great thing about Pragmatism, as the Humanism it is tending to become, is its emphasis upon the ethical and personal factors that enter into all our notions about final truth. Although Pragmatism denies any im-

personal or absolute truth, it need not remain a mere agnostical or relativity philosophy. On the contrary, Pragmatism would like to maintain that in volition we do know something about the inward meaning of things, and at least reality is what it comes to be in our purposes and ideals. The cause of Pragmatism's inability to show that the developmental view of things is the real view lies in its failure to recognize the existence and transforming effect of a supreme ideal of personal worth. Ethics as a normative science insists upon the fact that man superposes the ideal of his own personality upon the natural order, transforming it into a spiritual order. Recent researches into the facts of moral development show that the supreme authority attributed to the Moral Law is not an illusion, but that through the course of human history such an ideal has been working. Pragmatism has shown itself as yet unable to rise above the descriptive and hypothetical science of the day, to the ideals of the normative sciences.

The interesting chapter which follows upon Pragmatism as Americanism must be dismissed with briefest mention. Professor Caldwell shows powers of observation and discernment which carry him far beyond the obvious and tedious commonplaces which are so easy to repeat when discussing this subject. To connect Pragmatism with Americanism, he holds "would certainly not be to depreciate Pragmatism but to strengthen it by relating it to a spirit that is affecting the entire thought and life of mankind" (p. 170). Besides commenting upon the American-like characteristics that make themselves apparent in Pragmatism he singles out two features of American university life of which this philosophy may be regarded as a partial expression. There are the competition of studies which has resulted in a somewhat forced attempt on the part of pragmatists to make philosophy a 'live' subject, and the emphasis upon method of instruction which has made the upholders of Pragmatism willing to present it as a methodology of thought rather than a complete philosophy.

In the chapter upon Pragmatism and Anglo-Hegelian Rationalism Bosanquet's *Principle of Individuality and Value* is selected for consideration because typical of the best in 'Anglo-German Intellectualism.' This work is subjected to a very severe criticism, somewhat overwhelming in fact, as the author finds in it six positive errors, seven leading characteristics to which serious exception might be taken, seven positive contradictions, and notes four reasons for pronouncing it unsatisfactory from the standpoint of Ethics! Offsetting in a measure this drastic criticism is the admission on part of the author

of an "element of supreme truth and value in Dr. Bosanquet's unique book." "This is, in a word, its tribute to the permanent element of truth and reality in the idealistic philosophy" (p. 226). The first thing of transcendent importance and value in *Individuality and Value* is its insistence upon the fundamentally different estimate of reality given by philosophy in distinction from the merely hypothetical treatment of science. The second great thing is its insistence upon the need to all philosophy of a recognized grasp of the principle of *meaning*. "Overriding altogether the mere intellectualism of Dr. Bosanquet's interpretation is the fact of the *dynamic idealism* for which he virtually stands, in virtue of the great and simple effort of his lectures to find 'value' in our daily experience with its huge obstinate plurality of independent facts" (p. 227).

The concluding chapter upon the "Philosophy of Bergson" is notable for its appreciative account of the valuable features of the Bergsonian philosophy and its emphasis (over-emphasis, one is inclined to think) of the points of agreement between this philosophy and Pragmatism.

The book is a contribution of decided value to contemporary philosophy. The results of wide reading and continued study are skillfully organized and presented in clearly reasoned and compact chapters. The author stands ready on all occasions to acknowledge and explain the strong points of Pragmatism, which he regards as in the main true, at least as an approach to philosophy, while at the same time laying bare its weaknesses with the assurance of one who has entered sympathetically into the truth of a position but himself sees beyond it. With the general view of the author that conduct is the test of thought, provided conduct is governed by the universal ideals of personality, the reviewer is in entire agreement—such complete accord, in fact, as to divert his attention from minor points of difference. It is possible that the book suffers somewhat from brevity and condensation: the pragmatism theory of verification is perhaps too summarily disposed of; the pragmatist conception of evolution and the reality which is evolving seem to call for fuller consideration.

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NOTICES OF NEW BOOKS.

The Problem of Evil in Plotinus. By B. A. G. FULLER. Cambridge University Press, 1912.—pp. xx, 336.

Dr. Fuller has published an interesting and exceedingly well written book in which he attempts to measure the value of mysticism from the point of view of its treatment of the problem of evil. He is interested to prove that a mystical view of the universe must either resolve Reality into a oneness without plurality, a goodness without evil, or must confess its own bankruptcy as a metaphysic. The author finds Plotinus a particularly inviting subject for dissection because the characteristic of his mysticism was its unwillingness to give up both plurality and evil, at the same time that it insisted upon the utter oneness and goodness of the Real. Dr. Fuller believes this to be due to the fact that Plotinus succeeded to two traditions, the naturalistic and the mystical. The naturalistic tradition was responsible for his joy in natural goods, and for that highly peculiar aspect of his philosophy which followed from it,—the belief in a plurality of goods, each perfect in its way and yet not so perfect as the One. The mystical tradition, on the contrary, was responsible for that aspect of his philosophy which voiced the scorn and contempt for the things of the natural world—the body, the human passions, etc.—and which recognized nothing truly worth while save the infinite and ineffable One. Plotinus's effort, through emanationism, to resolve the conflict between these two elements in his view, Dr. Fuller finds to be wholly futile, the fundamental fallacy residing in the attempt to make difference in kinds of perfection interchangeable with differences in degree of perfection. There is, Dr. Fuller shows, scarcely a contradiction in the whole Plotinian theodicy which is not referable to this confusion of kinds and degrees; νοῦς, for example, cannot be at once a perfection *of its sort*, and also less perfect than τὸ ἓν. If, however, it is not less perfect, Plotinus's doctrine is a pluralism of perfects and not a mysticism. If, on the other hand, it is in fact less perfect, the world in so far has defect, and is therefore a dualism of good and evil, not a mystic monism. To hold that all comes from God, as light comes from the sun, helps in nowise to resolve the fundamental conflict here indicated. Dr. Fuller through his three hundred pages tosses Plotinus in painful alternation upon the horns of this dilemma.

And yet it is a question whether Plotinus the mystic would have been much perturbed by his critic's merciless treatment. In the first place he would doubtless have questioned, with some sad resignation perhaps, whether his conscientious critic really understood his view as a *mystic* would understand it; or whether, standing on the outside of the view, he was not applying to it standards and methods of criticism which might indeed have application in

his own outside region of thought, but which could have no pertinence *within* mysticism. To the profane all things are profanation. Mysticism, he would have said, is first of all an attitude,—of utter humility, of utter self-surrender, of utter love. Achieve this and all the universe is filled with the goodness and the joy of God. Everything not God is less than God; yet everything is God. All that is less than the fullness of God is imperfect relatively to God; yet all that is of God is perfect. To one who has achieved the attitude of utter love and utter humility there is no contradiction here. All is part and member of God's life; the parts are parts and yet are fulfilled of the whole. As parts they are less than God; as fulfilled of his spirit, they have the perfection that comes of his life.

And Plotinus would doubtless be perfectly justified in his reply. Dr. Fuller is not a mystic; he does not think as a mystic does. From the mystic's point of view, therefore, his logical dissections, analyses, counterpositings, etc., are simply the application of what Hegel would have called 'external reason.' And yet it does not follow that Dr. Fuller is wrong either, as to his own position regarding God and evil. No doubt the weight of modern conviction would be on his side. We, like him, are not mystics to-day. We do not easily abase ourselves. We are not transported in utter love and wonder of the universe. We sprunt up; we demand our rights; we are democrats. We cry 'Lo here' and 'Lo there!' What Dr. Fuller's book really shows (and shows admirably) is that from the point of view of our fundamentally unmystical way of thinking all such emanationistic explanations as Plotinus indulged in to reconcile the evil of the world with the superessential One, are utterly futile. Evil for us is evil; and we will submit to no mystical legerdemain to presto-change it into good. Plotinus believed evil to be good—really *believed* it; loved it, so to speak, into very goodness. We believe evil to be evil. And we stand stoutly on our rights and demand that it be manfully accounted for.

The value of Dr. Fuller's book, in short, lies not so much in its criticism of Plotinus (although one must acknowledge the value of much of the translation and exposition of Plotinian philosophy) as in its sharply critical handling of the problem of evil from our modern, non-mystical, self-assertive standpoint. No absolute optimism, he shows, no beneficent 'creationism'—and traditional Christianity falls here with all the rest—can any longer successfully resolve evil into good. That way is now closed. The alternative way, Dr. Fuller thinks, is through a frank and searching naturalism. In the discussion of the better way there is in the book much that is of interest and moment for students of religious philosophy, although it is a question whether they will find in Dr. Fuller's arguments a solution adequate to the perplexing problem of evil.

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Die Grundlagen der Naturphilosophie. Von HUGO DINGLER. Leipzig, Verlag Unesma G. m. b. H., 1913.—pp. x, 262.

The proper object-matter of epistemology, according to Dr. Dingler, is the field of exact science; yet not in all its empirical detail but rather in the ideal form which actual science more and more nearly approximates. Thus epistemology requires exact science as its datum; and even if the latter is not at present complete, yet there are certain parts which we cannot but regard as practically finished. Our object must then be to show how the scientific form is constituted.

Although the sciences grew up by and through particular observations, yet these observations, when compared and made more exact, gradually assumed a mathematical, deductive form which is independent of their particular content, and is the common element in all science. We find, then, "dass ganze Wissenschaften logisch völlig identisch sein können bei der absolutesten Verschiedenheit ihrer Inhalte" (p. 39). Geometry, in fact, was once an experimental science, even as Physics now largely is, but Physics is at length assuming the logical, deductive form. The method in every science is to reduce the given to the simplest propositions from which the rest can be deduced; economy, analysis into parts, and synthesis, are the processes by which we accomplish this result. And this is purposive activity: "nicht die Natur ist in diesem Falle die Herrin, sondern der Mensch, der schliesslich einen Vorgang so herstellt, wie er ihn haben will" (p. 53). When, indeed, the scientist consciously works out an experiment to reveal a certain law, he does prescribe law to nature. Yet in doing all this he abstracts, isolates and can do no better than approximate the facts. Generally speaking, apparatus is "Isoliermittel" (p. 64). *Two* systems thus open out before the mind of man: the general, deductive rational body of exact science, and the historical-actual or individual contents of the real world. The former can never describe the latter in their uniqueness and individuality.

This characterization of science is sketched out in the first two chapters; chapter three reveals the epistemological foundation upon which it must rest. In this chapter the influence of Mach, Avenarius, Petzoldt, *et al.*, is apparent. For example: "Jeder Satz, der eine logische oder kausale Verknüpfung in diesem Sinne enthält, oder jeder Begriff, der auf Grund solcher Verknüpfungen gebildet wird, ist also nicht mehr *Material, wie es uns die naive Welt darstellt*, sondern stellt schon eine gewisse *geistige Verarbeitung* solchen Materials dar" (p. 112). The criterion by which to distinguish all "geistige Verarbeitung" is as follows: "dass wir *alles*, worin wir uns irren können, der logischen Verarbeitung zurechnen, jedes Urteil also, welches auch falsch sein, auf einer 'Taüschung' beruhen könnte" (p. 119). "Die Trennung unserer Gesamtwelt in Innen- und Aussenwelt gehört der logischen Verarbeitung an" (p. 120). "So kann insbesondere *nicht ein erkennendes Subjekt mit den zu erkennenden Objekten als Gegensatz dazu am Anfang der Erkenntnistheorie stehen*" (p. 120). What *is* immediate given is "lediglich das *Erlebnis*" (p. 121). From this point of view the most difficult problems of epistemology find their

solution: for they are due to the delusion that the distinction of subject and object is ultimate and fundamental.

In Chapter four, "Psychological Questions," we have some fairly radical utterances. The feelings of other men than myself appear, in so far as they are 'inner' states as "eine logische Hilfskonstruktion, vorgenommen im Verlaufe der logischen Verarbeitung, eine Hypothese, eine Theorie" (p. 146). So far as it is behind the scenes, however, this concept is naught but a "Sterildefinition"; the proper direction in which to search for a definition of consciousness is the functional one. Consciousness should be treated as "eine Art Zentralisation der Nervenerregungen," "eine Art von Einrichtung oder Vorrichtung in unserem Gehirne" (p. 153); along this line definite information may be sought. When I am conscious of a house, we should not interpose a mysterious activity of attention to unite me with the house; "da bedarf es keiner Aufmerksamkeit und keiner Verknüpfung, sondern in diesem Momente ist das Haus gewissermassen 'Subjekt'; grob, und in der früher beliebten mystischen Weise ausgedrückt, könnte einer sagen: In diesem Momente bin ich das Haus" (p. 63). Chapter five draws certain consequences from these positions; we mention only the author's view of the freedom of the will. We cannot with absolute certainty predict what we shall do in a given circumstance; this is dimly felt, and constitutes our consciousness of freedom, "der *logische Kern* jener sehr vagen Vorstellungen und Empfindungen, welche man empfindet, und meist bisher mit dem Begriffe des 'Willens' verknüpft hat, und welche den Anlass gaben, *ihn als 'frei'* zu bezeichnen" (p. 182).

Chapter six is perhaps the most interesting in the book, taking up the central category of science, causation. As meaning a mysterious production of one event from another, the concept is neither scientific nor philosophical, but popular only. In defining the scientific meaning of the concept, the author follows what may fairly be called the current view. Causality is *functional dependence*. An event is totally determined when no part of it can be changed without contradicting the expressed conditions. The goal which advancing science approaches is that of mathematics; the concept of function will some day wholly replace the old popular notion of causation. ". . . so sehen wir, dass bei fortschreitender Theoretisierung und somit Anschliessung an den theoretischen Urbau immer mehr die gewöhnliche Kausalität ausgemerzt und funktionelle Abhängigkeit an deren Stelle gesetzt wird" (p. 213). After the discussion of causation some interesting reflections are found. Of extreme Hegelian rationalism (and by implication, of some modern systems of abstract logic, since Whitehead's *Universal Algebra* is here mentioned in a footnote) we read "dass es in der Tat möglich wäre, logische Gebäude, soviele man will, ohne weitere Beziehung zur Wirklichkeit aufzustellen, und bis zu beliebiger Komplication aufzubauen. . . . Diese logischen Gebäude (logische Hohlformen nannten wir sie auch) haben dann gar keinen Bezug auf irgendwelche wirklichen Verhältnisse" (pp. 223, 224). In spite of this insistence on experience, the fundamental procedure of science is regarded as based upon "Das Recht der Freiwilligkeit." "Man kann sie [the prescriptions of logic]

ableiten aus der *Tendenz zur Ökonomie*, aus einer *Regel zur Ökonomie, diese aber ist, und muss in unserem System völlig grundlos und freiwillig bleiben*" (p. 236). In thoroughly Kantian fashion the author recognizes the *apriori:* "Alles das aber, was wir Tendenzen zum Handeln genannt haben, ist hier, genau nach I. Kants grosser Entdeckung, *apriori*, d. h. unser Aufbau ruht in seinem letzten Fundament auf solchen Festsetzungen, und da unser Aufbau das ganze der wissenschaftlichen Erkenntnis enthalten soll, so sind diese also 'vor' aller Erkenntnis dieses Aufbaues, d. h. *apriori*" (pp. 236–7). A bibliography follows, with running commentary.

While recognizing many merits in the above work—of structure, clearness, carefulness in argument, and the customary (and wholly admirable) Teutonic patience, one cannot but feel that the book may be of more advantage to the author's philosophic standing than to the advance of philosophic knowledge. There seems to be very little that is new; old positions are re-fortified, other old positions are re-refuted. The author appears as one with a definite position indeed, but one reads a treatise on *Naturphilosophie* in the hope of securing more information about the meaning of science's categories, and has a right to be disappointed at finding only one more defence of Kantianism, Machianism, or other -ism. This relative unfruitfulness is partly due, we must believe, to a certain provincialism which is rather prevalent in current German philosophy. Of recent non-German authors in this field, Poincaré and Duhem are the only ones mentioned—save for a merely nominal reference to Whitehead, Karl Pearson, and Russell. The important work of Meyerson in France,—to say nothing of the whole movement of which Bergson is the culmination—the detailed discussions of Russell in England and of Royce in our own country, upon the philosophy of science, are such as no writer in this field can afford to leave unnoticed. We remain in the hope of further work from Dr. Dingler upon *Naturphilosophie*, but upon broader lines.

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La notion d'expérience d'après William James. Par Henri Reverdin. Genève et Bâle, Georg et Cie.—pp. xxii, 221.

M. Henri Reverdin thinks that the concept of experience has been important in the history of philosophy, and has set himself in this book the task of bringing together in order as chronologic as is compatible with logical form, the contributions made to the development of the concept by William James. In the latter's thinking, M. Reverdin believes, the concept of experience was central. Concerning James's use of it he attempts to establish that James, "far from presenting at all times one and the same definition or description of experience, and a unique and single theory of experience, has regarded it from a multitude of points of view and has delivered upon it numerous and diverse pronouncements which cannot all be reconciled." Accordingly James is to be observed (1) "at the outset of his career, the partizan of empiricism," contrasting reality with possibility, championing contingency; (2) as psy-

chologist, describing 'the stream of consciousness'; (3) as epistemologist, formulating a theory of experience different from the foregoing and distinguishing between inner and outer experience, empirical truths and necessary truths; (4) as radical empiricist, defending the theory of 'pure experience'; (5) as student of the varieties of religious experience.

M. Henri Reverdin carries out this program faithfully, expounding the variation of the meaning of experience which the ripening knowledge of the years led James to make. But M. Reverdin does not see in this variation a development. He sees a contradiction. In his concluding chapter he points out, with the effect of reproach, that James did not conclude his speculations with what he began them; the meaning of experience had changed for him: by the laws of logic he had committed a crime. Alas! In this respect M. Henri Reverdin invokes the credo of the orthodox *philosophiae doctor*, and applies the canons of orthodoxy in criticism. These ordain that a thinker's life-work must be a formal consistency rather than a growth, and that logical validity is more important than material.

This is the fundamental reproach which M. Henri Reverdin levels at James —that the meaning he assigns to experience "comes and goes between two extremes: on the one side, the content of experience (l'expériencé); on the other, pure experience (l'expérience pure). . . . the latter cannot be experienced, the former is not a term toward which it moves, but only . . . a point of departure for every scientific and philosophic operation" (p. 207). And this is contradiction. In another place M. Reverdin writes . . . "in reading James I get the impression that however close he approaches to objectivism (thus our knowledge of empirical truths would be absolute: a duplicate of the object itself) he remains subjectivistic in an equal degree (all our sciences would be without direct contact with the real, in addition to being contingent, to participating in the contingency of spirit itself) and in an equal degree, finally, in his radical empiricism (a certain interpretation would entitle us to call it his "expériencisme") the distinction between object and subject appears to evaporate, either in the absorption of the object by the subject or in the absorption of the subject by the object" (p. 212).

These citations need no help from the critical commentator to show how completely M. Reverdin has failed to grasp the movement of James's thought in its transition from methodological to radical empiricism. M. Reverdin gives one the impression of a reader who has succeeded in putting words and sentences together rather than in tracing the actual relations of ideas. It is necessary only to note the implied antithesis between 'the content of experrience' and 'pure experience' (q. v. *supra*) to observe how far afield from the line of James's development M. Reverdin wanders. In point of fact his comments are the consequences of dialectical reconstruction which is a truer indication of M. Reverdin's way of thinking than of William James's. And this is clearest, perhaps, in the former's charge that the latter's cosmological and metaphysical speculations are not empirically grounded for the reason that they involve the notion of contingency, the notion that the world might as

easily not have been. Contingency and possibility are central to James's vision; so is empiricism. But contingency and possibility are, according to M. Reverdin, non-empirical. Facts do not carry within themselves, he urges, and hence cannot reveal, their own contingency. Possibility is not an empirical idea, etc. M. Henri Reverdin nowhere makes clear what he himself means by possibility and contingency, and there is no reason why, taken as he means them, they should possess the properties he denies them. But James's specification of these terms is on record, and if such denotations of them as occur in "The Experience of Activity," in the chapters on causation in *Some Problems of Philosophy*, etc., had really come home to M. Henri Reverdin, he would have been in the position to spare himself the trouble of an *ignoratio elenchi*. For all that James demonstrably means by them is the perennial observation that in all change there occurs an incalculable element, gain and loss *un*implied in and not provided for by what precedes them; that novelties arise and older things lapse. The appear*ing* of an *un*implied datum designates it as possible merely: its disappear*ing* is contingency. It has not been, it becomes, it is; it is, it fades away, it is not. This is all that can be found, in a non-dialectical reading of James's accounts of possibility and contingency. A possible chicken, he says somewhere, is an actual egg. And the egg may never hatch, and if hatched, the chicken may never live out its life. In a word, contingency and possibility are given as data in the complex we call change. Generalized, the perception of them is turned into an inductive speculation concerning the whole of reality. This speculation may never be verified *in toto*, but then, what speculation is? Does this however prevent it from getting the piecemeal verification of the whole run of experience, from moment to moment? If it does, M. Reverdin ought to be able to exhibit the snows of yesteryear and the birds in last year's nest.

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Man a Machine. By JULIEN OFFRAY DE LA METTRIE. Chicago, Open Court Publishing Co., 1912.—pp. v, 216.

This reprint, with an English translation and notes, of La Mettrie's essay *L'Homme Machine* is due to the department of philosophy of Wellesley College. The appended notes and outlines are condensed from a master's dissertation by Gertrude C. Bussey. The translation also is based on a version by Miss Bussey, but has been revised by Professor Calkins, who claims responsibility for it. While the interpretative and critical notes have no more value than is to be expected from a master's dissertation, the outlines and historical notes are really useful and add to the availability of the translation, especially for class use. The translation has been made with care. One notes, however, a few slight inaccuracies, as for example, the rendering of *le grand singe* (p. 29) (the 'orang-outang') by *a large ape*, which weakens the force of the paragraph. Such slips aside (and few translations are free from them) we have to thank Wellesley College for a volume of real value.

La Mettrie's essay itself is of great interest. As against the rationalistic dualism of Descartes the empirical materialism of La Mettrie is overwhelmingly convincing. The contentions of *L'Homme Machine* are, indeed, for the most part the commonplaces of later science. Not only is sense experience immediately dependent on the mechanical functioning of our bodies, but so equally is the most abstract thought of the philosopher and the noblest virtue of the saint. A clot of blood on the brain can reduce a genius to imbecility or a hero to a human monster. One cannot with Descartes explain the reflex and instinctive acts of men as due to the mechanism of the nervous system and still maintain the independence of reason. One cannot on physiological grounds deny an immortal soul to animals and claim it for man. All living organisms are mechanisms through and through. A heart cut from the body continues to beat and after it has ceased will begin again if plunged into hot water. So a bit of muscular fiber contracts when mechanically stimulated long after its nervous connection with the brain is severed. Descartes' comparison of the body to such a piece of mechanism as a Diana in a grotto mysteriously moved by water forced through pipes which can be turned on and off at will by the operator at the center does violence to the facts. Each separate organ, each bit of tissue, functions spontaneously, and the intelligence of the behavior of the organism as a whole is nothing but the coordination and mutual adjustment of these functions. Since there is no function left for a transcendent soul to perform, we have no reason to believe in its existence. La Mettrie's doctrine is a materialism comparable to that of Tyndall or Huxley. There is only one substance in existence—namely what we call matter, but since we must attribute all these functions to matter, it is not the passive extension which Descartes conceived it to be. It is the source of unknown potentialities and its nature is incomprehensible to us.

One cannot read the essay today without coming to the conclusion that in almost every point at issue La Mettrie was justified as against his opponents; and yet one is surprised at oneself in making this admission. Most of us are descended from a philosophical ancestry far removed from the succession of physiologists to which La Mettrie belonged. We have been used to looking upon materialism as a comprehensive name for the crudest form of dogmatism; but time works strange revenges and we stand today closer to La Mettrie's empirical monism than to the dogmatic dualism of Descartes or Locke. Ten or fifteen years ago this could not have been said. Then the conflicting theories of parallelism and interactionism offered themselves as the sole alternatives. Now both are discredited, and no one today can approach the problem of the relation of mind and body save from the standpoint of the essential unity of the psycho-physical organism. GRACE ANDRUS DE LAGUNA.

Festkrift tillegnad Edvard Westermarck. Helsingfors, 1912.—pp. 304.

This is a *Festschrift* by Professor Edward Westermarck's London and Helsingfors pupils, on the occasion of his fiftieth birthday. Papers have also been contributed by his former teacher, Dr. Th. Rein, ex-Chancellor of the Helsing-

fors University, and by Dr. A. C. Haddon, and Dr. W. H. R. Rivers. While the book is largely a contribution to ethnology and anthropology, it nevertheless contains considerable material of value to philosophical workers in the logic of the social sciences, social psychology, religion, moral evolution, and kindred subjects.

"The Economic Aspect of the Intichiuma Ceremonies," by B. Malinowski, is a suggestive interpretation of Spencer and Gillen's and Strehlow's accounts of the Australian intichiuma ceremonies. Upon the ground that since these ceremonies have for their purpose the increase of the food supply, and involve organization, collective effort, regular application of energy and division of labor, the hypothesis is advanced that such ceremonies as these have been the means by which totemic peoples have been educated in the direction of economic labor. This suggestion, developed further here than by Frazer, seems plausible, and leads one to wonder if the moral aspects of these ceremonies do not deserve similar consideration.

"The Disappearance of Useful Arts," by W. H. R. Rivers, shows that useful arts once in the possession of various peoples in Oceanica have subsequently been lost by them. This is specifically illustrated in the case of pottery, the canoe, and the bow and arrow. Ordinary utilitarian explanations, like the absence of raw material and the death of craftsmen, are in most instances insufficient. To supplement them, Dr. Rivers suggests the hypothesis that religious and magical factors must also have been operative. In Oceanica it is not enough to know how to manufacture a canoe; one must also be able to perform the necessary and elaborate magical and religious rites. The disappearance of useful arts through the death of craftsmen may have been due, not merely to loss of their manual skill, but as well to the loss of the spiritual power, the *mana*, which they alone could bring into operation. This whole question is important in showing that we need not infer that islands must once have been connected with the main land because their present human inhabitants are devoid of means of transportation, and in warning us against overestimating the importance of utilitarian motives in cultures widely different from our own.

"The Clan as a Local Unit in Society," by Rud. Elander, is a defence of the position suggested by this title, taken in his volume "The Chief of the Indian Clan in North America," in reply to the criticisms of Dr. Lönborg.

Rudolf Holsti, in "Some Superstitious Customs and Beliefs in Primitive Warfare," takes to task a large group of ethical and sociological writers, both militarists and anti-militarists, who, although confessing that warfare between modern civilized nations involves too many factors to admit of so simple an analysis, have taken for granted, without troubling to investigate the facts, that among primitive peoples warfare has been a direct agency of natural selection. A large mass of evidence, supported by a great wealth of citations in the manner of Westermarck, is presented to show that natural selection operates in no such direct fashion in primitive warfare. On the contrary, magic, omens, and supernatural beliefs and practices of every sort are the

most conspicuous and dominating factors in determining the conduct and outcome of primitive warfare, the natural actions of men being reduced to subordinate influence and importance. So it cannot be claimed that the groups defended by the ablest warriors necessarily survive.

"The Conception of the Causal Relation in Sociological Science," by Gerald Camden Wheeler, argues that the cause-effect relation can be approximated in the ideo-graphic or historical sciences, using Windelband's expression only to the extent that the element of unique changes can be neglected, and identical recurrences can be assumed to take place. This can best be done in Ethnology, where the slowness of the changes among the cultures studied renders them negligible. Ethnology, however, suffers from 'flatness,' want of depth in time, in consequence of this monotony. Ethnological phenomena must therefore be reconstructed in a temporal succession in order to render a causal interpretation possible. Graebner and his school are credited with having in some measure indicated how this is to be done. But Mr. Wheeler does not make it clear how social sciences can both ignore the teleological movement in history which he regards as irreducible to a causal series, and at the same time avoid the 'flatness' mentioned.

The article in the volume having most philosophical interest, especially for the logic of the Geisteswissenschaften and for the philosophical side of social psychology, is "Die Stellung der anthropogeographischen Synthese in der Soziologie und Geschichtsphilosophie" by K. R. Brotherus. While geographical conditions have been important in determining the phenomena both of sociology and history, they are difficult of interpretation, and the investigator is prone to read his own subjective experience into the facts. For this reason the employment of geographical explanations in the literature dealing with the origin of races and the explanation of traits of national character have been largely unsuccessful, and at best can only claim such subjective verification as the inner personal experiences of the investigators can furnish. In sociology, which deals with universal laws, and not with particular events and individual experiences, geographical explanations are not available. The situation in history is different. History, unlike sociology, is concerned with particular events, and not with universal laws. In the explanation of particular occurrences the influence of geographical conditions is significant and ascertainable, though not so potent as the innate characteristics and inclinations of human beings.

This writer insists that it is impossible to universalize geographical factors. In this connection he criticizes Ratzel and others who have tried to classify forms of culture by general types of geographical surroundings, such as islands. Such generalizations overlook the individual conditions that prevail in every locality and make it different from every other. The historian as an anthropogeographer must indeed reason in terms of cause and effect, but he cannot employ them as a natural scientist would, since in his field there always enters a teleological factor that cannot be universalized.

The philosophy of history, like history itself, posits values. Just as the

historian presents fragments of historical development that correspond to ethical values and illustrate their concrete realization, so the task of the philosopher of history is to find the realization of ethical values in history considered as a whole. The hypothesis that geographical conditions help determine historical events is of no significance for the task of the philosopher of history as thus stated. For this hypothesis does not define values, but only maintains that the environment helps to determine whether these values will appear in a realized form under given circumstances. The hypothesis, however, is utilizable in the type of questions suggested by the last statement. Does the influence of geographical factors, for it must be conceded that they have some influence, increase or diminish in history? Can man overcome geographical limitations and realize values where previously it was impossible for him to do so? Light can be thrown on such questions, provided they are made definite and specific, by drawing upon the history of agriculture, transportation, commerce, and *Kulturgeschichte*. In this manner the geographical hypothesis can be related to ideas of value, and positive content can be given to the problem thus developed in the philosophy of history.

This paper seems to me to be convincing in its general position that geographical explanations at present are only practically available in helping to explain when and where values happen to appear in realized form. But Mr. Brotherus seems to me to assume a rationalistic and transcendent theory of values that does not necessarily follow. Granted that accidental conditions of time and place do not create values of which the human spirit already knows, but only determines whether man can then and there achieve them, still we may ask how these values have arisen in the human consciousness in the first place. Must not geographical conditions have played their part in the discovery of the values, for instance, that Israel, Hellas and Rome first gave to the world; and is not the reason why we may now regard them as independent of local conditions simply because they are our heritage from a past which present conditions cannot alter? Mr. Brotherus does not face the question of the origin of values in the first place, although his treatment at times seems almost to suggest a Platonic view of their ontological existence apart from occurrences in historical time. However, this is not his main point, and we may concede to him that in the present stage of development of their disciplines it is practically impossible for anthropologist, sociologist, or philosopher of history to make sweeping generalizations on the basis of geographical conditions that are really more than their own subjective impressions.

The paper by Dr. A. C. Haddon, "The Houses of New Guinea," is a careful digest of the available knowledge on this subject with reference to the influence of totemism and like institutions in this region. Gunnar Landtman, in "Wanderings of the Dead in the Folk-Lore of the Kiwai-speaking Papuans," reports his own investigations into the spiritistic beliefs of these folk, and gives one the impression that among them a religion is slowly evolving from their close relations with their departed spirits. One wishes that his report indicated more clearly the bearing of his observations upon general questions of this

sort. Hose and McDougall in their recent work upon the natives of Borneo have set an example in this respect that it is to be hoped may be more generally followed by field investigators.

The remaining articles in the volume are: "Allmänna opinionen," by Dr. Th. Rein, and papers by Professor Westermarck's pupils at Helsingfors, viz.: Thure Svedlin, "Om olika slag am tvekamp i norden"; Ola Castrén, "Samhällsuppfattningen hos Bernard Mandeville"; Rolf Lagerborg, "Platons kvinnopolitik"; J. J. Sederholm, "Hutton och Werner"; and Yrjö Hirn, "Pappersdraken."

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Beauty and Ugliness, and Other Studies in Psychological Æsthetics. By VERNON LEE and C. ANSTRUTHER-THOMSON. London, John Lane, The Bodley Head, 1912.—pp. xvi+376.

The chief author of this volume is the well-known essayist—in private life, Violet Paget. Readers of her numerous volumes on art and appreciation may be in some measure prepared for this collection of more serious studies in æsthetic theory. But although the author brings to her task a wide experience and a keen æsthetic sensibility, she appears to possess few of the qualifications for scientific exposition. It was in 1897 that the essay which furnishes the title to the present volume first appeared in *The Contemporary Review*. At that time Miss Paget was but slightly familiar with modern literature on æsthetics. This she tells us in reiterated passages and footnotes. Indeed, the book is scarcely more than a commentary which aims to correct and enlarge upon the central thesis which the original article sought to maintain.

The thesis in question was based largely upon the introspective observations of Miss Anstruther-Thomson, who collaborated only in the original work. This lady appears to be a person of pronounced motor type, and the analyses of her acts of appreciation in the presence of works of art reveal a wealth of mimetic elements, chiefly of breathing and equilibrium. The conclusion first reached was that the active experience of these movements furnishes the basis for the feelings of pleasure and displeasure which characterize the sense of beauty and ugliness,—the Lange-James theory of emotion being found to supply the needed psychological substantiation for such a conclusion. The article came to the attention of Theodore Lipps, who reviewed it with sharp criticism. This served to introduce Miss Paget to the doctrine of empathy, as expounded in Lipps's familiar writings. She also made the acquaintance, then, of Karl Groos and other German æstheticians, including some experimental work, especially that of Külpe and his pupils. As a result of this enlightenment, the chief author of the work on *Beauty and Ugliness* has modified her views, and here sets them forth with becoming modesty in five supplementary essays.

The first of the group, entitled "Anthropomorphic Æsthetics," emphasizes the "discovery of the projection of our inner experience into the forms which we

see and realize as being the central discovery of modern æsthetics" (p. 17). The second essay, on "Æsthetic Empathy and its Organic Accompaniments," is a translation from the original French published in the *Revue Philosophique* (1907). In this paper Lipps's theory of æsthetic empathy is subjected to a rather extended critique, the point being made that while he is justified in his contention that empathy does not involve a sense of adequate bodily adjustment, he is misled in supposing that the *aesthetische Miterleben* of Gross is without sensory foundation. "The Central Problem of Æsthetics," a more closely written exposition of the author's modified views, appeared first in translation in the *Zeitschrift für Aesthetik und Kunstwissenschaft* (1910). The conclusions, which are in part based upon responses obtained from a questionnaire, substantiate Lipps's view that empathy as a purely 'mental' phenomenon requires no bodily sensations, nor any definitely or vaguely localized 'feelings of activity' for its existence. In general, it is noted that all such imitative movements correspond to peculiarities of the shapes as such, and "are absolutely independent of what objects or movements the lines and shapes are intended to suggest to our minds" (p. 139). Next in order comes the original essay, "Beauty and Ugliness." The fifth essay is entitled "Æsthetic Responsiveness: Its Variations and Accompaniments. Extracts from Vernon Lee's Gallery Diaries, 1901–4." In these scrambled entries, comments and *aperçus*, are to be found some of the most valuable contributions of the volume. As the author intimates, the points of chief interest to be gleaned from these notes may be classified roughly as the objective and subjective sides of æsthetic perception. She sums them up for us in two sentences:—(1) "The work of art is, so to speak, its own showman," and (2) "The total impression of a work of art is, I think, the sum of a series of acts of attention." To these two points we may devote a few words of comment and quotation.

1. It is emphasized that the true work of art is entirely self-contained. "One reason for not marking the eyeballs (of a statue) is that doing so directs the glance outwards; the statue focuses. Now a statue ought, so to speak, *to focus inwards* . . ." (p. 260). There is no need that the perception of form should be connected with our own gesture, and too great a reality is inimical to æsthetic perception. "It is the being busy, the doing something which makes bad statues unrestful, and prevents our looking at them" (p. 258). In this same connection, the author expresses doubt as to whether the Doryphoros and Apoxyomenos are standing still or walking. "In fact," she continues, "they *are not doing either* any more than a mountain. They will never be otherwise *than they are*. The 'movement' we talk of is a pure movement of lines, either of lines rising, expanding, carrying, etc., when we stand fixed before them, or of lines changing when we walk round (or in the 'frontal' ones *across*) them" (p. 258). Again, "reality, real movement, are in fact equations between our powers of recognition and a symbol, and they are therefore shifting, for the symbol alters. But the equation between our æsthetic faculty and 'form' does not alter, because there is no symbol" (p. 328).

2. The subjective side of Vernon Lee's æsthetics is incomplete. As a recent

reviewer of this volume has noted, we miss any extended consideration of æsthetic attitude. It is the process of apprehending and perceiving, rather than the process of assimilating which has chiefly occupied the author's attention. Regarding æsthetic experience, we read the following: "There exist in experience no such abstractions as *æsthetic attention* or *æsthetic enjoyment*, but merely very various states of our whole being which express themselves, among other results, in various degrees and qualities of responsiveness to works of art" (p. 243). "The action of art is not hypnotic, not monoideistic, but by making a little walled garden of the soul of all manner of cognate things, a maze, in which the attention runs to and fro, goes round and round, something extremely complex and complete, taking all our faculties" (p. 344). All culminates in the perception of form, and again we verge upon the notion expressed in *Beauty and Ugliness* that form is a peculiar category of experience:—"May not the perception of form be, normally, a sub-conscious process accompanying the conscious process of recognition of the subject of the work of art, the utility or name of the thing represented? And would not this explain our inability to say *why* we like a form, as opposed to our manifest facility in saying *what* that *form symbolizes or suggests?* In other words, are we not pursuing a necessarily unclutchable phenomenon in our pursuit of perceptions of beauty and ugliness?" (p. 270).

The "Conclusion" affords some further indications of the reconciliation which the author has sought to establish between her earlier views on mimetic activities as the essential basis of æsthetic appreciation, and the position of Lipps, which denies sensory adjuncts in æsthetic empathy. The dynamic-empathic interpretation which she now holds is regarded as due to "extremely abstract ideas of movement and its modes residual from countless individual and possibly racial experiences" (p. 353). The mimetic-organic sensations are accordingly taken into account as a possible clue to the origin of these abstractions. The actually existing and suggestive movements which may still be found in the act of appreciation are probably chiefly those of the eyes and related parts. These, she holds, may explain the starting and keeping up of dynamic empathy. Her present belief is that æsthetic pleasure is not explicable in terms of the feelings which attach to these sensations, but can be explained "on the ground prepared by such economy and replenishment of attention as is necessary for any kind of pleasant intellectual activity" (p. 358).

Although the net result of this enquiry, extending over some fifteen years, is still incomplete in its survey of the elements involved in æsthetic appreciation, we must acknowledge the earnest and unprejudiced spirit of the enquirer. It is a hopeful sign when a writer of popular æsthetic criticism of such recognized literary ability enters the field of exact knowledge for the purpose of clarifying her ideas and principles.

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The Persistent Problems of Philosophy. An Introduction to Metaphysics through a Study of Modern Systems. By MARY WHITON CALKINS. Third Revised Edition. New York, The Macmillan Company, 1912.—pp. xxvi, 577.

This book, first published in 1907, has now reached its third edition. "The present revision of the book," Miss Calkins tells us, "has been undertaken primarily in order to relate its conclusions to the more recent of contemporary philosophical writings, and, in particular, to refer to the arguments against idealism so loudly urged by those who call themselves 'neo-realists.' Advantage has also been taken of the opportunity to amend and to supplement many passages of the book." The preface gives a detailed list of the additions and changes in this edition. It also calls attention to two points of terminology: (1) "to the useful, and neglected, distinction between 'qualitatively' and 'numerically' pluralistic or monistic systems, and (2) to the use, throughout the book, of the term 'idealism,' in the widest possible sense to mean 'the conception of reality as of the nature of consciousness.'"

With regard to this last point, there can be doubt that the protest against the limitation of 'idealism' to subjectivism is amply justified. Against the latter theory the neo-realists have claimed an easy victory; yet their victory has been barren because their logic has not allowed them to advance a step beyond the position which they criticize. But it seems to me doubtful whether Miss Calkins is justified in holding that her own use of the term 'idealism,' to mean that the universe is 'personal' or 'of the nature of consciousness,' is "the widest possible." I should be inclined to use the term 'idealism' for any philosophy that holds to the continuity and inner relationship of all of the various parts of reality. Anything is 'ideal' in which the nature of a whole is bound up, and which therefore cannot be defined by itself but only in terms of its 'representative' value and functions. Whether this category leads on necessarily to the conclusion that the universe is 'personal' is a question on which individual idealists disagree; the category of an Absolute person, or an Absolute experience is not necessarily, it seems to me, the only form under which an objective idealism can be maintained.

The *Persistent Problems* is a book which has gained a permanent place for itself in philosophical literature. Whether one approves the classifications of philosophical systems in the formalistic manner of this work, one is compelled to admire the clear and scholarly character of its presentation of problems and systems, and the courage with which it maintains the importance of the great issues of modern thought. It is assumed throughout that philosophy is not something that needs to be rendered 'interesting' by any external devices, but that it is a serious business demanding our best scholarship and most persistent thought. This is a book written for students, but a book which assumes that students of today still possess the intelligence and interests of their predecessors. The appendix and notes contain much valuable information, partly bibliographical, partly in the form of exposition,

that will be found valuable for everyone concerned with the history of the modern period of philosophy.

J. E. C.

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I. *Eine Serienmethode für Reaktionsversuche.* NARZISS ACH. Untersuchungen z. Psych. und Phil., I, 5, pp. 1–44.

II. *Bemerkungen zur Untersuchung des Willens.* NARZISS ACH. Unters. z. Psych. u. Phil., I, 5, pp. 47–49.

III. *Fortlaufende Arbeit und Willensbetätigung.* DR. ANDREAS HILLGRUBER. Unters. z. Psych. u. Phil., I, 6, pp. 1–50.

IV. *Über Willenshemmung und Willensbahnung.* DR. GUSTAV GLÄSSNER. Unters. z. Psych. u. Phil., I, 7, pp. 1–143.

I. This article is a very minute description with many diagrams of an elaborate set of apparatus used for presenting without interruption in small, variable time-intervals a series of visual stimuli, and for accurately recording both the contents and the time of speech-reactions. For this purpose the author employs a combination of phonograph and dictaphone. He presents several pages of Tables showing the calculation of various mechanical factors of operation and their constant errors. In a final paragraph he discusses the theoretical significance of such an elaborate method for psychological purposes and points out that while in the early stages of psychological experimentation the question of technique was overemphasized and the importance of the instruction to the observer was neglected, in the present stage there is a strong tendency for the opposite error, which his method tries to counteract by combining delicacy of apparatus with due consideration of the nature of the instruction (Aufgabe) and of course minute introspection.

II. This is a short reply to some criticisms of Ach's book *Über den Willensakt und das Temperament*, by O. Selz, in which Ach points out that he does not hold, as assumed by Selz, that any short or abbreviated act of will must contain all the factors which a complete or most energetic expression of will reveals. Other objections are refuted in Glässner's work (cf. IV).

III. The problem of this investigation was the study of the relation of voluntary effort to continuous mental work. The general method was to present a senseless combination of consonants and vowels of the type "tudap," which the observer first had to read aloud and then to modify aloud by interchanging the first and last consonants, thus reading "pudat." This was continued with many stimuli for ten minutes, once at a slow rate, once moderately fast, and once at a fast speed. The original reading and the identity of the three middle letters favor the perseverative tendency to repeat merely, which had to be overcome by an act of will or strong concentration of attention. The faster speeds increased the obstacle. The apparatus used was the one described by Ach in a previous article (cf. I). Four observers completed three series, one of each speed, on each of six successive days. The time of reading and of the reversed re-reading was measured and a record of errors in both was kept.

After eliminating the influence of fatigue and practice by proper fractionation of the data, the following results seem to be of greatest significance: (1) The difficulty of a mental activity acts as a motive for a stronger exertion of will or concentration of attention, because with the fastest speed the shortest reaction-times were given, and the greater subjective difficulty seems to be indicated by a larger number of errors. The reviewer is not convinced that this "law of motivation" is established by the results, because the author has not shown that the gain in speed or the increase in quantity of work does *more* than offset the loss in accuracy or decrease in quality. (2) The process of habituation as revealed in these experiments shows itself more in the decrease of errors than in an increase of quantity, and occurs more strongly but also more slowly with the more difficult task than with the easier work. (3) Fatigue may be considered as a motive for greater exertion of voluntary effort, while practice or the resulting feeling of greater ease act frequently as a check. (4) The effect of practice shows itself in a decrease of errors and seems more noticeable with the harder task. (5) The consciousness of weakness in the choleric temperament leads to a greater exertion, while the sanguinic temperament seems to work best under some external compulsion. The interpretation of many of the results seem to the reviewer somewhat strained.

IV. This investigation, like the previous, was undertaken in Ach's laboratory at Kōnigsberg. The author proposes to make a detailed study of one or two factors of will which had been found as an incidental but important biproduct in some of Ach's previous work. The two factors are the inhibition and facilitation of voluntary effort through the reproductive and the determining tendency. The method is in general the same as Ach's, but involved many refinements in the construction and arrangement of the nonsense-material. The procedure consists of two parts. In the first part series of nonsense-syllables constructed after special patterns are repeatedly presented and memorized aloud. The number of repetitions determines the strength of the associations formed between the members of each series and may be easily varied. In the second part some of these nonsense syllables are shown again among new syllables also constructed in determined ways, and in connection with this re-exposure certain formal mental activities are required of the observer. Sometimes he has to reproduce the former preceding or succeeding associated syllable, or he has to make a rhyme to the stimulus-syllable, or he has to interchange its first and last letters. The nature of the reaction as well as its time are recorded. The relative strength of the determining and the reproductive tendency is measured by the difference between their average reaction-values and the number of errors. Many arrangements and precautions were made for the sake of eliminating certain disturbing factors and thus meeting a number of objections which Selz had raised to Ach's results.

We can enumerate here only a few of the more general conclusions.

1. The refinement of Ach's method verifies in many new ways and unequivocally the previous evidence for the inhibitory and facilitative effects of reproductive and determining tendencies, establish certain laws for their

operation, and furnish a manifold measure of unconscious resistance and its conscious symptoms of inhibition.

2. In an association of sufficient strength this resistance not only may, but must take place in a degree corresponding to the strength of the association.

3. The relation between resistance and inhibition as measured by these results may be used as an index of the voluntary effort or intensity of the determining tendency, and thus enable one to compare different individuals with regard to their strength of will.

4. An inhibition may be caused not only by a total mental complex, but also by its parts or constituents. The same holds true of facilitation.

5. The results proved conclusively that Selz's objections were eliminated in the present investigation and had been of very little, if any, influence in the previous work.

6. The pleasant feeling of greater ease is not a cause but a conscious symptom of subconscious facilitation which expresses itself quantitatively in quicker reaction-times and fewer errors.

7. Inhibitions and facilitations may occur side by side and in their general effect either partially or totally neutralize each other.

8. Ach's law that a determining tendency realizes itself the quicker and surer the more detailed it is, finds confirmation and is due in part to special facilitations, to determined apperceptions, and to adaptation (*Einstellung*) to certain secondary means.

9. These conclusions may find practical application in teaching and in various aspects of daily life, as the author indicates in some detail.

L. R. GEISSLER.

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Die Seele des Menschen. Von J. REHMKE. 4. völlig umgearbeitete Auflage. Leipzig, Teubner, 1914.—pp. 109.

The little book is the fourth edition of Rehmke's *The Human Mind*, well known to German students of philosophy. It is a short popularization of the ideas which the author develops at large in his *General Philosophy* (2d ed., 1905). When Professor Sheldon reviewed Rehmke's *Philosophy as Fundamental Science* in this REVIEW (vol. XX, no. 6), the German philosopher was not yet acknowledged as he is now. Nobody in Germany can deal nowadays with psychological problems in a scientific way without previously squaring himself with Rehmke.

From the numerous "Introductions to Psychology," Rehmke's book differs entirely. He is not satisfied by stating that we do not, and cannot possibly, know what 'soul' or 'mind' means, differing thus from Wundt, for example, who accordingly deals with the term 'mind' or 'soul' without actually making clear what he means by it. Rehmke starts by determining the exact meaning of the philosophical terms. In doing so, he shows how many philosophers came to false conclusions merely by not giving a concise meaning to the terms they used. By carefully analyzing the meaning of 'mind,' Rehmke finds that

this term can only denote an "Einzelwesen" (individual) which is in a constant working system with the body,—refuting thus by this dualistic solution Spinoza's theory of parallelism as well as the 'double aspect' theory and others. Just as the body's "Bestimmtheiten" (modes or conditions) are locality, quantity, and form, so those of the mind are what Rehmke calls the objective ("gegenständliche"), emotional ("zuständliche"), and thinking ("denkende") modes.

In the second part, the author deals with the special qualities of the mind as such. As an objective consciousness (soul, mind and consciousness being exactly the same), we perceive and reproduce,—reproducing differing from perceiving only by the absence of the nervous excitation; as an emotional consciousness, we have pleasure and displeasure; and as a thinking consciousness, we combine and separate,—thinking being used here in the sense of judging, as in logic. Finally Rehmke speaks of the mind as causative consciousness, in which case it is will, and he gives a clear distinction and explanation of the different kinds of willing.

In a time when a revival of mysticism even in the refined form of Bergsonian thought tends to obscure philosophical language, Rehmke's demand for clear definition of the philosophical terms before using them, is doubly to be welcomed. Had he lived in Kant's time, and had Kant read Rehmke, there would certainly be less diversity in the interpretations of his *Kritiken*. Of course, we do not find in Rehmke's writings those picturesque images which form the charm—and also the danger—of books like those of Bergson. Rehmke's writings are not intended to appeal to the writer's imagination,—they appeal only to his intellect, and in this respect, they cannot be praised too highly. Though a popular treatise, Rehmke's *Human Mind* is rather difficult reading, the style is not easy, but it is clear and precise, and that is the essential thing.

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The following books also have been received:

Philosophy and Religion. By HASTINGS RASHDALL. New York, Charles Scribner's Sons.—pp. xvi, 189.

The Philosophy of Bergson. By BERTRAND RUSSELL. With a reply by H. WILDON CARR and a rejoinder by BERTRAND RUSSELL. Cambridge, Bowes and Bowes.—pp. 36. 1 shilling net.

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The Socialized Conscience. By JOSEPH H. COFFIN. Baltimore, Warwick and York, 1913.—pp. viii, 247. $1.25 net.

The Algebra of Logic. By LOUIS COUTURAT. Authorized translation by L. G. ROBINSON. Chicago, The Open Court Publishing Co., 1914.—pp. xiv, 98. $1.50 net.

An Introduction to Logic from the Standpoint of Education. By L. J. RUSSELL. London, Macmillan and Co., 1914.—pp. vii, 137. $.90 net.

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La Conscience morbide. Par CHARLES BLONDEL. Paris, Alcan, 1914.—pp. ii, 335. Fr. 6.

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Essai sur la Formation Philosophique du Poète Arthur Hugh Clough: Pragmatisme et Intellectualisme. Par EDOUARD GUYOT. Paris, Alcan, 1913.—pp. 170.

Introduction à la Médecine des Passions. Par MAURICE BOIGEY. Paris, Alcan, 1914.—pp. iv, 280. Fr. 3.50.

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SUMMARIES OF ARTICLES.

[ABBREVIATIONS.—*Am. J. Ps.* = *The American Journal of Psychology*; *Ar. de Ps.* = *Archives de Psychologie*; *Ar. f. G. Ph.* = *Archiv für Geschichte der Philosophie*; *Ar. f. sys. Ph.* = *Archiv für systematische Philosophie*; *Br. J. Ps.* = *The British Journal of Psychology*; *Int. J. E.* = *International Journal of Ethics*; *J. of Ph., Psy., and Sci. Meth.* = *The Journal of Philosophy, Psychology, and Scientific Methods*; *J. de Psych.* = *Journal de Psychologie*; *Psych. Bul.* = *Psychological Bulletin*; *Psych. Rev.* = *Psychological Review*; *Rev. de Mèt.* = *Revue de Mètaphysique et de Morale*; *Rev. Nèo-Sc.* = *Revue Nèo-Scolastique*; *Rev. Ph.* = *Revue Philosophique*; *Rev. de Ph.* = *Revue de Philosophie*; *R. d. Fil.* = *Riviste di Filosofia e Scienze Affini*; *V. f. w. Ph.* = *Vierteljahrsschrift für wissenschaftliche Philosophie*; *Z. f. Ph. u. ph. Kr.* = *Zeitschrift für Philosophie und philosophische Kritik*; *Z. f. Psych.* = *Zeitschrift für Psychologie und Physiologie der Sinnesorgane, I. Abtl.: Zeitschrift für Psychologie.* —Other titles are self-explanatory.]

Vom Wesen der Wissenschaft. ERNST SAUERBECK. V. f. w. Ph., XXXVII, 4, pp. 501–33.

The three classes of scientific method are empiricism, mechanism, and evolution, of which the two last belong together as rationalistic in contrast to the empirical. Empiricism, by the principle of association, can bring everything into connection; cause and effect are external to each other and need have nothing in common. Its creed is the uniformity of nature; its applicability is limited to that which is repeated, because it denies inner relations and so depends on the number of cases in which things have been seen together. Reality which is unique and individual falls outside its scope. The basis of the rationalistic method is the doctrine that the inner relation of similarity, the 'order of ideas,' holds objectively of events. Causality is not mere sequence, but depends on underlying identity, which can be discovered in a single case. Comparison in the narrow sense of complete assimilation is the principle of mechanism; comparison in the wider sense of grouping by grades of similarity, characterizes the evolutionary method. This theory of evolution is not Darwinism: it seeks to prove a single, unilinear development according to law; it is not a timeless system, for what appears next in order to the mind, is held to be the chronological order in nature. The object is not to establish facts but to mark the ways by which man, through conclusions independent of immediate experience, can attain to reality; not to show whether in given cases there is actually such evolution, but to maintain an internal form of science, an order in the chaos of events. By this stepping out of subjective limitation into reality we can determine only general characteristics, such as repetition or uniqueness, quality or quantity, total or partial identity; that is, we do not decide whether reality actually has these characteristics, but only what it would mean if it did have them. The

question then is: How must reality in general be created, if each of the three methods could explain the whole world? Empiricism can achieve its goal only in a world of repetition, where all the cases can be counted; but this is seldom possible. Mechanical rationalism applies to a world of quantity, and of quality only in so far as it can be reduced to quantitative terms; it must therefore end where the qualitative psychical realm begins. It is of wider range than empiricism in that it applies to non-repeated cases; but it is more restricted than empiricism in that the latter applies to psychical as well as physical phenomena, if they are repeated. The historical-evolutionary, systematically chronological, comparative form of rationalism does not separate the qualitative from the quantitative, and is not limited to repetition. Its principle is that things which have the inner relation of resemblance are also objectively related. This connection may be that of mere similarity, or the order may be that of progress. Such a method explains only a world which is brought without remainder into a system whose parts throughout stand in inner relation and range themselves without exception in a single long line. But no all-embracing principle of arrangement has been given. Qualitatively different types stand unrelated; so that this is nothing but empiricism as a universal scientific method.

NANN CLARK BARR.

The Meaning of Reality. J. S. MACKENZIE. Mind, 89, pp. 19–40.

Much discussion and difference of opinion concerning the affirmations of Reality is due to ambiguities in the use of the term. The term Reality may be employed in different ways. It may be used in the sense of simple Being, or that which has a place in the Universe. It may mean definite existence, or that which has a place in the order of normal human waking experience. It may be used in the sense of truth or validity. It may be used in the sense of the positive as contrasted with the negative. Reality may also be used in an intensive sense to express the degree in which anything occupies a place in some order. Again, it may mean Actuality, or that which presents itself to us now and here as distinguished from that which is merely potential. And, finally, Reality may mean that which is substantial or independent. There are several negative theories which either altogether deny the validity of the conception of absolute Reality or the possibility of knowing anything about it, or else they throw doubt upon its validity or the possibility of knowing it. These are Nihilism, Agnosticism, Pragmatism and Scepticism. There are also four theories which affirm the possibility of knowing Reality. The first is Dualism, which usually takes the form of one of the following antitheses: force and matter, form and matter, universal and particular, mind and body, etc. The second, Monism, is an attempt to escape from dualism. Its chief forms are pluralistic or singularistic Objectivism, pluralistic, singularistic, or purely subjective Subjectivism, and Absolutism under various forms. The third is Pure Pluralism of which the New Realism is the chief type. And, finally, the fourth positive theory of Reality is Cosmism which involves a

plurality, the members of which are combined in accordance with a definite law.

HENRY BENTSON.

Natural and Rational Selection. G. C. HENDERSEN. Inter. J. of Ethics, XXIV, No. 2, pp. 127–147.

For Thomas Huxley the cosmic process in the organic world and the social process in the human world were different processes. Regardless of this, some students who claim to be followers of Huxley contend that the key to human history is the struggle for existence and the survival of the fittest. In human evolution a new factor, self-consciousness, enters. Self-consciousness is the power of looking before and after, of conceiving ends and constructing ideals. The following are the important characteristics of natural selection and of rational selection. Natural selection is a struggle between members of the same and of different species. The struggle involves the extinction of the unfit and the survival of the fittest. It yields greater perfection of form. It is a blind mechanical process. Rational selection is open-eyed and purposive. To be sure mechanism operates in human life, but a consciousness of ends is also a determining factor. This distinction between blind and purposive evolution supplies the fundamental difference between organic and human evolution. The different methods of selection yield different results. Natural selection is a slow murderous process which involves the disappearance of the less fit. Rational selection may be and often is a rapid humane process involving a struggle between ideas, not between men. This contrast shows that rational selection is more worthy of the dignity of human life than natural selection. However, in striving to obtain rational selection, we must not forget that at any time we may be involved in natural selection, that the struggle is not merely between ideas but sometimes a death struggle between human beings. Strength and swiftness are developed by natural selection, and if these qualities are imperilled by a corrupt civilization it would seem better to return to the old struggle of natural selection for a time rather than to lose these qualities altogether. In the past the organic theory of evolution has been applied to human development too widely. Evolution, to be sure, applies to human affairs as well as to other forms of life. However, a theory of evolution which will explain both organic and human life must be more comprehensive than the one we have at present.

C. M. HOBART.

Introduction générale à l'étude psychologique des phénomènes religieux. M. DE MUNNYNCK. Rev. des Sc. Ph. et Théol., VIII, 1, pp. 5–50.

Current psychological literature, especially in America, shows a tremendous interest in religious psychology; but it is important to add that there is nothing less religious than this 'psychology of religion.' Some who prosecute this study, as William James, have a 'pragmatic sympathy' for religion, more are openly opposed to it and disposed to treat it as an abnormal, infantile or even

socially dangerous mental phenomenon. Particularly from the standpoint of Catholicism would the conceptions of these writers have to be excluded from what is understood by the religious. Some writers have claimed, with a show of reason, that an attitude at least of emotional indifference is necessary to the scientific study of religious phenomena; but a juster consideration will show that the irreligious psychologist is at a distinct disadvantage in the study of religion. Too many of the psychic data are inaccessible to him. His study is limited to the mere manifestations, which afford a study valuable indeed, but necessarily incomplete, and his interpretations are naturally inadequate. We can never expect to have a real psychology of religion until it is constructed by religious psychologists. The subject-matter of religious psychology is of course religious phenomena, but what is to be included under this head is a matter of general controversy. Many thinkers of the past—Empedocles, Lucretius, Hobbes, Feuerbach—have defined religion in such a way as to destroy it by the very definition. Among our contemporaries, Guyau regards it as a phenomenon of primitive mentality from which adult humanity must necessarily free itself; Sergi considers it a morbid manifestation and an obstacle to human progress. Even those whose attitude has not been hostile have differed widely as to what constitutes the core of religion. The age of the 'Aufklärung' eliminated everything but a purely intellectual 'natural religion.' Today, the commoner custom is to find its center in some feeling or other or in the volitional nature. To get at a true definition, it is necessary to view our conscious life as an organized whole. It is all bound together by unifying principles, ruling ideas or psychic vortices as it were. Such principles are professional obligations, ties attaching us to family or groups of friends, recreational interests, etc. A hierarchical series of these principles gives our lives a high degree of solidarity. The richest and most complete life is the most perfectly organized. But different lives are organized on different planes. Despicable creatures find the dominant principle in sensibility. Higher principles are love of glory, ambition; above these is the love of truth, and we find natures unified by intellectual motives. But there is a higher nobility; Faust was forced to put at the origin of things, neither Word, Sense nor Power, but Action. Truth has not exhausted its nature until it expresses itself in the Good. The highest human principle of unity is in the Will. We can rise above this only by rising above ourselves. This it is given to us to do, and here we find the essence of religion, to unify our lives through a principle outside ourselves, under the influence of divinity. As in other sciences, a logical division and classification of the subject-matter will be necessary to the complete and systematic treatment of the psychology of religion. Current expositions show a sad deficiency in this respect. A *General* subdivision of the subject should treat of the *nature* of religious phenomena (already discussed), their *degree*, from irreligion to sainthood, and their *origin* and *psychologic basis*. This should be followed by a *Special* subdivision, taking up *general effects*, both individual and social, and each of these both normal and pathological; then *differential effects*, connected either with the combat against

evil (conversion, repentance, etc.) or with the production of good (mysticism, etc.). The Method also of this science should not be notably different from that of others. In the observation of facts, a wise use of questionnaires would be its principal resource, and the facts when obtained should be elaborated and systematized in the light of the particular purpose in view. A crucial point in the development of religious psychology must be the delimitation of its field and aims in relation to those of theology. The psychological 'explanation' of the phenomena can have no bearing whatever on their supernatural import. With this theology alone can deal. When each of these two sciences is restricted to its proper domain, they will be found not to conflict, but each will be an invaluable aid and supplement to the other.

F. H. KNIGHT.

From John Stuart Mill to William James. P. B. VOGT. Catholic University Bulletin, XX, 2.

James and Mill may be studied in relation to each other because Pragmatism is the latest exponent of the empirical movement in whose development Mill also took part. As Mill reduces logic to subjective psychological relations, so James regards concepts as the means of classifying impressions, not as having objective validity. For both thinkers, universals are mere experimental truths, arrived at by induction from the evidence of sense. The question concerning the origin of knowledge is purely psychological-genetic; the only standard and source of knowledge is experimental induction. James is, therefore, one with Mill in denying that laws of thought are independent of subjective psychical experience; and in affirming psychology to be the ultimate source and foundation of truth, thus reducing all logical laws to psychological ones. For James, truth is not the static relation of correspondence between our minds and reality but is the working of an idea in relation to the other experiences in which it plays a part; truth being psychologic, remains subjective and relative. Mill's interpretation of the correspondence theory is also subjective; to appeal to the test of facts in order to ascertain truth, means to appeal to our permenent possibilities of sensation. For both James and Mill, therefore, truth is a relation within our changing experience; it is relative, unstable, dynamic. Although James opposes the associationism which resolves consciousness into its elements and exhibits knowledge as arising from the combination of these data, he also arrives at the conclusion that reality's sense experience and reality itself are for us identical. Finally, Mill's attitude was essentially Pragmatic in that he endeavored to have a method rather than a closed system.

NANN CLARK BARR.

L'innéisme Kantien des fondements mathématiques. LOUIS DE CONTENSON. Rev. de Ph., XIV, 1, pp. 16–37.

This is the first of three articles on the 'apriorité' of mathematics. Kant's whole philosophy rests on his scepticism of the senses, leading him to distinguish between representations and things-in-themselves and to regard the

objective aspect of things as eternally problematic. Assuming a principle as little demonstrable as that of the fidelity of the senses from which he recoils, viz. the possibility and necessity of certain judgments, Kant reasons thus: certain ideas exist; sense ideas are uncertain; therefore, certain ideas are a priori. He revives then the Cartesian ideas, possessing a necessity not derived from experience, and true precisely because not so derived. Kant's trouble lies in his blind acceptance of the traditional belief in the apodictic certainty of mathematics. Without establishing this certainty or justifying his belief in it, Kant seeks to ground his faith by assuming the existence of synthetic judgments a priori. Reversing the normal order of things, Kant deduces from the categorical imperative God as the postulate of morality, and from the supposed certainty of mathematics the certainty of its fundamental axioms. Kant believed that all mathematics was as certain and exact as the elementary mathematics which alone he knew, and which like all elementary science was schematic, sacrificing complexity for simplicity and representing the inexact as exact. Kant's discussion of the triangle indicates that he did not understand mathematics. He was ignorant of the notion of "infiniment petit"; also of "géométrie infinitésimale," without which it is impossible to construct geometric space; also of "l'algèbra supérieure," which alone yields adequate knowledge of the notion of "continuité," the most indispensable concept of mathematics. Kant's deduction of discontinuity is inadmissible. He confuses the notions of "grandeur" and "nombre."

Kant deduces his fundamental concept, "la grandeur," from the concepts of time and space, which for him are subjective, though he frequently furnishes us with arguments which prove that they are not absolutely subjective, not imposed on nature by the understanding, but imposed necessarily on the mind from without. Time "en soi" has an objective reality as constituting the possibility of change, and space "en soi," of movement; but since the concepts of space and time are subjective and analogous to images that correspond to real objects, they cannot serve as a basis of an apodictic and universal science. Kant thought that knowledge of the self establishes the existence of time though not that of space. Knowing the self is an act of pure thought in which sensibility plays no rôle. Kant, influenced by his fundamental principle that we never know things-in-themselves, makes the absurd error of supposing that time, and therefore sensibility, plays a part in self knowledge.

Hegel preserves the subjectivity of time and space and secures certain mathematical judgments, though not universally valid ones. Hegel's assumptions as to space and time are gratuitous if not false. The remaining alternative is to consider space and time as real things whose concepts are given us by experience and mathematics as a "Science expérimentale," and therefore not apodictically certain. Therefore the fundamental principles of mathematics are not based on time and space or else they are a posteriori.

RAYMOND P. HAWES.

Religion et raison. E. BOUTROUX. Rev. de Met., XXII, 1, pp. 1–17.

The isolation of religion and reason in watertight compartments does not solve the problem of their relation, and neither the pragmatic method of harmonizing them, nor the conceptual method of setting up and comparing their definitions, satisfactorily reveals this relation. History shows that religion and reason, far from being contradictory or mutually exclusive, influence each other continually and are drawing towards a reconciliation, *e. g.*, religion was responsible for the advance of reason from a purely logical, abstract reason to a reason furnished with principles able to comprehend the highest and most diverse forms of being. Abstract reason of syllogistic logic, based on the principles of identity and contradiction, deals with "concepts"; concrete, living reason, with "ideas." From the standpoint of "concepts" religion and reason are mutually exclusive or the one reduces to the other; from that of "ideas" they are mutually penetrating or complementary: their relation is one of partnership which preserves to each, however, its reality and individuality. But neither as "concept" nor as "idea" is reason self-sufficient. Kant and Hegel have shown that the synthetic function of reason presupposes a principle higher than itself. The self-transcendency of reason implies that it draws on the energy of some superior source, the source of individuality and worth. Reason stands in need of religion's fundamental dogma, the reality of God and of his relation to the world. Religion puts an end to reason's hesitations and doubts and makes possible the perfection reason aspires to. Religion is not the contemplation of a perfection, transcendent and inaccessible; it is the kingdom of God realizing itself on earth; it is God calling to men and communicating to them the power of obeying his commands. God is not a stranger to the world; He is loved as father. Religion satisfies reason if it is set to the same problems that our science and life set for our reflection. The central characteristic of the true religion is its ability to fortify the human mind and make it more productive in the execution of its natural human tasks. Religion stimulates more profound and effectual thinking, while reason is essential to religious conviction and belief. Thus reason to realize itself seeks the support of religion, while religion to accomplish its work requires reason's aid.

RAYMOND P. HAWES.

Some Preliminary Considerations on Self-Identity. HAROLD H. JOACHIM. Mind, 89, pp. 41–59.

Foremost among the "unquestionable facts" in the world are our own Individuality and Self-Identity. What then do we mean by Self-Identity? If we say that the "I" is an embodied spirit, we must recognize the fact that the body is constantly changing. Therefore, Self-Identity can not be the spirit plus the body. All attempts to explain the Identity of the body from the point of view of Chemistry, Biology, and monadic centers of force must fail. The identity of our bodies through the different moments of their life is like a theme with variations. Identity itself is differentiated, itself changing

and developing: the different stages and the successive states are its variations and the phases of its being. The unity and identity of the body are "ideal." The real "I" is spiritual. But the concrete embodied spirit is not an incommunicable and impenetrable individual which exists merely to himself. We share in common joys and sorrows, hope and enthusiasm. We strive towards a common ideal and give expression to a common love. This tends to show that our spiritual selves are the individuations of a universal spirit. All change, action and reaction, is the manifestation of an immanent spiritual principle. We must recognize this universal spiritual substance which is self-individuated, self-appropriated and self-manifest as the personality of man. There is ultimately no past or future for the real "I"; "I am."

HENRY BENTSON.

Some Antecedents of the Philosophy of Bergson. ARTHUR O. LOVEJOY. Mind, N. S., 88, pp. 465–483.

Bergson's metaphysics is based on two Cartesian propositions and one Kantian proposition. The Cartesian portion is the division between extended things and consciousness, and the contention that consciousness is known with the greater certainty. The Kantian portion is that Time is the essential characteristic of consciousness. Bergson's problem is the determination of the attributes of time, especially in its relation to quantity. His solution is that time, and therefore consciousness, is unrelated to quantity. This view of Time did not originate with Bergson. The school of Ravaisson and the school of Renouvier had, before Bergson, obtained the same solution to the same problem. Ravaisson, in his *Essai sur l'habitude*, holds to the four fundamental propositions of Bergson's theory of time: (1) that to think of a quantity or number as constituted by distinct elements is to consider the parts or units as coexistent; (2) that coexistence can be considered only spatially; (3) that to apply extension to anything is to think of it spatially; (4) "tout ce qui est de l'espace est hors du temps." Bergson's real time is secured by drawing the consequences of propositions already developed by Ravaisson. The essence of our time experience is secured by Ravaisson in his Ego, by Bergson in his pure duration. Even closer correspondence to Bergson's arguments, and to the conclusion he reaches in his '*Essai*' of 1889 is to be found in the school of Renouvier. Dauriac, of this school, held that temporal experience could never lead to notions of mathematics, and quantity whether discrete or continuous could not be applied to the psychic order. The arguments used by Dauriac in contending for his position suppose the main premisses upon which Bergson's arguments for real duration are based. Just as Dauriac foreshadowed the first chapter of Bergson's *Essai*, Noel foreshadowed the second chapter. Noel contended that the concept of coexistence was necessary for the treatment of a series of events in a fictitious manner as simultaneous. Noel also said that inner duration is really a numerical succession. Although Bergson denies this, nevertheless he takes it as true. Bergson's position is: (1) the most certain reality is our conscious existence, (2) this existence is essentially tem-

poral, (3) the problem is to determine the nature of the temporal, (4) the temporal is usually misrepresented due to the thinking of time spatially, (5) the temporal is truly non-quantitative and unrelated to number. The first four propositions were held generally by the neo-criticist school and the fifth had been advanced by Dauriac and Noel. This fifth characteristic is based upon three supports. First, psychological observation of mental states must be compared not as quantities but as qualities. The second support relates to the logical relation of number, coexistence and spatial extension. The third support is that such a view of duration allows us to escape the paradoxes of the continuum and at the same time to hold to the reality of time. The first support was advanced by Dauriac, the second by Ravaisson and Noel, and the third by the neo-criticists in general. The assumptions and reasonings of the first two chapters had been analyzed and refuted by Pillon half a dozen years before the book was written.

C. M. HOBART.

Self-Sacrifice. J. B. BAILLIE. The Hibbert Journal, XII, No. 2, pp. 260–282.

In genuine self-sacrifice, the individual deliberately gives up some good to himself. Merely giving up a good is not self-sacrifice. The good must be sacrificed so as to attain a positive result. This positive result must be good or the act of self-sacrifice becomes an evil one. This result which the sacrifice intends to secure must not be merely the welfare of the agent making the sacrifice. The end realized by the sacrifice must further the welfare of human personality, and this welfare must be greater than the good sacrificed. The agent must not sacrifice his highest good, that is his moral personality, under any consideration. All sacrifice is subordinated to the conservation of personality. The total sacrifice of self leads to self-sophistication. We will now consider the moral basis of self-sacrifice. What right has an individual to indulge in self-sacrifice, and how is such an indulgence justified morally? In self-sacrifice an actual good is renounced, an actual loss occurs. The act cannot be deferred self-interest. The conception of the insulated individual yields the result that self-sacrifice is immoral. In actual life self-sacrifice is approved on a moral basis. This justification cannot be secured by an appeal to religion. The point is we do not have the insulated individual. We start with community life in which the individual is only a part of the greater whole. No individual is called upon to bear the whole burden of social life. The fulfilment of our parts constitutes us as moral beings. This view means that the common welfare is more enduring, more universal and a more complete realization of good than the individual's good. This is the principle which lies at the root of self-sacrifice and gives us the only moral justification of such an act. The sacrifice of self is made for the social life. The justification of any act is that the good of the whole is advanced. No individual can demand self-sacrifice as a duty from another individual. An individual may require another to realize his good, but he can never require him to renounce his good. Whether the individual receives any reward by making the sacrifice is not

important. Self-sacrifice presupposes other forms of good and therefore can not be either the only source or form of goodness. The highest end of man is the realization of human personality. In religion all moral ideas are recast and revalued. A moral idea in the sphere of religion is taken in its most perfect form. Self sacrifice when thus considered from the religious point of view emphasizes the unity of man and man in the common life. Self-absorption in this life is the essence of religion. In its religious aspect self-sacrifice is the outcome of love. It is this religious love which has led and still leads to the greatest deeds of self-sacrifice.

C. M. HOBART.

Principienfragen der Denkpsychologie. RICHARD HÖNIGSWALD. Kant Studien, XVIII, 3, pp. 205–245.

The history of the 'Back to Kant' movement has been largely the history of a demarkation of the critical from the psychological field. Throughout the movement, psychologism has appeared as the arch enemy of critical thought, though unable at its best, or worst, to undermine the permanent position of that thought. Whether psychologism as such is possible depends upon its relation to psychology, upon the possibility of the conditions of psychology, especially of thought psychology. Much is being said of the inexpressibility of the psychical process, but it can be in no case a principle of psychological insight; nor can the idea of a 'negative' psychology pave the way for the epistemological investigation of a science of the psychical. The indispensable presuppositions of thought psychology are the concept of thinking and the thought activity of the object of research. The question, "What is thinking?", cannot be answered in the terms of psychology without going back to the hopeless quest for an unthinking substrate of thought and the gross errors of conception and association psychology. An objection to thought psychology is raised under the false supposition of an antithesis between the experience of thought and its representability. The whole problem of thought psychology is involved in the analysis of the force of meaning, which is constitutive of thought experience. The system of relations which defines meaning as an experience of significance makes possible the judgment form, in itself only a moment of the validity-determination. On the other hand, the idea of validity-determination becomes intelligible only as the fulfillment of the legitimacy of the judgment form. Logic and epistemology as well as psychology are subject to the law of this correlation. They are bound to break down if it is assaulted. This is precisely what psychologism does. It denies the concept of the forms of psychology when it destroys the relation through which alone that concept becomes possible. When with psychologism one ceases to consider the judgment form a correlative and, in such sense, independent factor of the experience of meaning, one destroys the meaning-reference, which has been seen to be a constitutive element of thought experience. Finally, thought-psychology is not only an object, but also a vehicle of the critical

method. In a new form it vindicates the imperishable value of Kant's problem formulation.

ANITA FREDERICA DE LAGUNA.

Pragmatic Realism—The Five Attributes. JOHN E. BOODIN. Mind, N. S., 88, pp. 509–525.

Substance has come to mean the postulate of totality; that every fact under certain conditions makes a difference to other facts. If these differences concern us they must be able to become differences to a reflective consciousness. The systematizing of these differences yield certain irreducible attributes. These attributes are stuff, time, space, consciousness, and form. The question of attributes goes back to Spinoza. He is inconsistent with his infinite attributes. By hypothesis they make no difference to thought, yet they are assumed. He is also inconsistent in considering the relation between thought and extension. Extension is conceived and thus does make a difference to thought. When he treats the problem of knowledge, mind becomes the consciousness of bodily actions; but when he treats the problem of conduct, all agency is attributed to systematic thought. Modern science has three attributes: space, time, and energy. However science has failed to define these. Science has neglected the attribute of consciousness. Science also assumes that facts can be explained by a finite number of principles. Being is the stuff character of reality. Reality need not be reflective in order to make a difference to experience. Unnoticed experience and physical processes affect our reflective consciousness. Stuff is observed directly. The other attributes can only be observed as they affect the stuff structure of the world. Stuff structure includes the purposes of the self. How is time related to the realization of our purposes? Time is real because it necessitates new judgments. The differences which time makes cannot be stated in terms of the intervals of the clock. Real time accounts for changing values and shifting positions. Space is of such a nature as not to interfere with movement. For practical and scientific purposes we assume a space zero. Another characteristic of space is that of distance. Real space must not be confused with the perspective furnished by psychology and logic. Consciousness is a unique attribute of awareness or interest. This awareness is a neutral light. The conditions of awareness are the object context and conative tendencies. Consciousness must not be confused either with its conditions or with its species. Since the awareness is colorless, its color is due to psychological processes. Form is direction. This attribute gives place to such a question as: Is there direction in this process? Our finite meanings are very fragmentary. The relative is not satisfactory. We desire finality. Form is required to give meaning to our fragmentary purposes. Since form is thus needed, it is as real as the purposes. These attributes differ from those of Spinoza in that all these presented here affect our creative purposes.

C. M. HOBART.

Die Entstehung des Stoichen Moralprinzips. GOTTFRIED BOHNENBLUST. Ar. f. G. Ph., XX, 2, pp. 171–187.

This paper discusses the origin and the development from Zeno to Marcus Aurelius of the Stoic maxims of consistency and conformity to nature. Diogenes Laertius and Stobaesis disagree as to the relations, both logical and historical, between the "formal" principle of the harmonious life (τὸ ὁμολογουμένως ζῆν) and the "material" principle of the life harmonious with nature (τὸ ὁμολογουμένως τῇ φυσει ζῆν). There is doubt as to whether Zeno used both expressions, and if so, whether they were equivalent for him, and as to what his conception of nature really was. The difficulty of the problem is due to the eclecticism of the Stoics, their readiness to employ an old formula as a practical maxim for conduct, without considering the theoretical implications. The result of the argument goes to show that Zeno used both formulas, and that they persisted through the whole history of the school, although they were greatly modified by the four "heretics." For the most part the two maxims were regarded as equivalent, but the emphasis tended to fall upon the more definite one on account of the increasing importance of the conception of the unity of nature in a principle underlying all her changes. But this view of the unity of nature was not always the same. With Zeno and Cleanthes it was a religious-aesthetic feeling derived from the half mystic theories of Heraclitus. Hence their attitude to ethics was intuitionistic. Chrisippus was the first to suggest that the empirical observation of nature could give a guide to conduct. His interpretation of the unity of nature, then, was scientific, and his ethics empirical in spirit. But even in this most definite determination, the principle of conformity to nature was only of negative value; it could not prescribe the positive content of life. Perhaps for this reason the later Stoics found the sanction for the traditional maxim not in the scientific, but the emotional conception of nature, in the feeling of unity with the cosmos which finds its sublime expression in the words of Marcus Aurelius.

ANITA FREDERICA DE LAGUNA.

Sociology and Psychology. J. H. LEUBA. Psych. Bul., X, 12, pp. 461–467.

Durkheim, opposing Individual Psychology to Sociology, holds that the origin and development of religion are exclusively a concern of Sociology. If for him Sociology includes or is synonymous with Social Psychology, his position is unobjectionable. The origin and development of religious phenomena cannot be completely understood when merely "observed from the outside," without the assistance of a psychological interpretation of the states of consciousness they express. Sociology must not confine itself to an examination of man's external activities; the introspective method is indispensable. Individuals reflect but also modify social life; they are "centers of creative energy." "Sociology is a psychological science of which the observation of social institutions is merely the starting point," for since the units of societies are conscious beings, the ultimate explanation of social life must be in terms of consciousness.

RAYMOND P. HAWES.

NOTES.

We record with regret the death from pneumonia on February 20 at the age of 47 of Dr. Arthur Henry Pierce, for the past fourteen years professor of psychology at Smith College. Dr. Pierce was a graduate of Amherst (1888), took his M.A. (1892) and his Ph.D. (1899) at Harvard, and also studied at the universities of Berlin, Strassburg and Paris (1894–1897). He was the first incumbent of the Kellogg University Fellowship (Amherst), which he held from 1894 to 1900. His chief work, *Studies in Auditory and Visual Space Perception*, was published in 1901. Among his other publications the most celebrated is his "Appeal from the Prevailing Doctrine of a Detached Subconsciousness," which appeared in the Garman memorial volume in 1906. He was for three years secretary of the American Psychological Association (1908–1910) and for three years thereafter a member of its Council. During the past four years he edited the *Psychological Bulletin*. He leaves the memory of an inspiring teacher, a sane and conscientious investigator, an efficient and tactful administrator and, above all, a fine and generous personality.

Professor George Stuart Fullerton has closed his lectures as exchange professor from Columbia University to the universities of Austria. At the end of the final lecture at the University of Vienna, it was announced by the Dean that Professor Fullerton had been elected an honorary professor of the philosophical Faculty of that University. This appointment carries with it the permanent right to deliver lectures at Vienna.

The annual meeting of the Western Philosophical Association was held at the University of Chicago on April 9 and 10. Professor B. H. Bode delivered the presidential address on "The Psychological Doctrine of Focus and Margin," which will appear in the July number of this REVIEW. One session was devoted to a discussion of the Neo-Realistic doctrine of Relations. Another discussion, led by Professor Fite, was concerned with the subject of Natural Rights. At the same time there took place a meeting of the Conference on Legal and Social Philosophy. The two societies met in joint session for the discussion of "Rule versus Discretion."

It has been decided that the next meeting of the American Philosophical Association will be held at Chicago during the last week of December.

Professor E. C. Wilm, of Wells College, will next year have charge of the departments of philosophy and psychology at Bryn Mawr, during the absence of Professors Leuba and de Laguna.

We give below a list of articles in the current philosophical periodicals:—

THE JOURNAL OF PHILOSOPHY, PSYCHOLOGY AND SCIENTIFIC METHOD, XI, 4: *M. E. Haggerty*, The Twenty-second Annual Meeting of the American Psychological Association.

XI, 5: *W. H. Sheldon*, An Empirical Definition of Value; *Edward K. Strong Jr.*, Two Factors which Influence Economical Learning; *Walter B. Pitkin* Concepts and Existence.

XI, 6: *Ralph Barton Perry*, The Definition of Value; *W. B. Cannon*, Recent Studies of Bodily Effects of Fear, Rage, and Paln.

XI, 7: *Arthur R. Schweitzer*, Some Critical Remarks on Analytical Realism; *Jared S. Moore*, Value in its Relation to Meaning and Purpose.

THE PSYCHOLOGICAL BULLETIN, XI, 2: *W. V. Bingham*, Report of the Secretary of the American Psychological Association; *W. C. Ruediger*, Report of the Secretary of the Southern Society for Philosophy and Psychology.

THE BRITISH JOURNAL OF PSYCHOLOGY, VI, 3 and 4: *William Brown*, Freud's Theory of the Unconscious; *T. H. Pear*, The Analysis of Some Personal Dreams, with reference to Freud's Theory of Dream Interpretation; *Carveth Read*, The Conditions of Belief in Immature Minds; *Frank Smith*, An Experimental Investigation of Perception; *C. W. Valentine*, The Color Perception and Color Preferences of an Infant during its Fourth and Eighth Months; *T. H. Pear and Stanley Wyatt*, The Testimony of Normal and Mentally Defective Children; *Charles Fox*, The Conditions which arouse Mental Images in Thought; *Godfrey H. Thomson*, On Changes in the Spatial Threshold during a Sitting.

THE PSYCHOLOGICAL REVIEW, XXI, 2: *H. C. Warren*, The Mental and the Physical; *C. Spearman*, The Theory of Two Factors; *A. H. Pfund*, On the Use of the Rotating Sector in Photometry; *M. LeRoy Billings*, The Duration of Attention; *Edward K. Strong, Jr.*, The Effect of Size of Advertisements and Frequency of their Presentation; *F. L. Wells and V. A. C. Henmon*, Concerning Individual Differences in Reaction Time.

ARCHIV FÜR GESCHICHTE DER PHILOSOPHIE, XX, 2: *Branislav Petronievics*, Über Herbarts Lehre von intelligiblem Raume; *Gottfried Bohnenblust*, Die Enstehung des stoischen Moralprincips; *A. Coralnik*, Zur Geschichte der Skepsis, I, Franciscus Sanchez; *Eckart v. Sydow*, Das System Benedetto Croces.

ARCHIV FÜR SYSTEMATISCHE PHILOSOPHIE, XX, 1: *Felix Rappaport*, Zur Logik des Wollens; *Albert Sichler*, Zur Verteidigung der Wundtschen Psychologie. Eine Metakritik; *S. Werner*, Wille und Willensfreiheit; *Fritz Dehnow*, Wesen und Wert des Rectsgefühls; *Ernst Barthel*, Kausalforschung und Metaphysik; *O. Hilferding*, Zur Analyse Menschlicher Denkarten.

ZEITSCHRIFT FÜR PSYCHOLOGIE, 67, 5 u. 6: *K. Koffka*, Beiträge zur Psychologie der Gestalt- und Bewegungserlebnisse; *K. Koffka*, Einleitung; *F. Kenkel*, Untersuchungen über den Zusammenhang zwischen Erscheinungsgrösse und Erscheinungsbewegung bei einigen sogenannten optischen Täuschungen.

68, 1 u. 2: *Luise Schlüter*, Experimentelle Beiträge zur Prüfung der Anschauungs- und der Übersetzungsmethode bei der Einführung in einen fremdsprachlichen Wortschatz; *Max Meyer*, Vorschläge zur akustischen Terminologie; *Theodor Ziehen*, Kurze Bemerkungen über Reaktionsversuche bei Lappen und Samojeden.

REVUE DE PHILOSOPHIE, XIV, 2: *Philippe Champault*, Des bases méthologiques de la Géographie humaine; *P. Duhem*, Le temps et le mouvement selon les Scolastiques (trosième article); *Pierre Florian*, De Bacon à Newton.

L'Œuvre de la Société Royale de Londres; *Louis de Contenson*, L'innéisme Kantien des fondements mathématiques (deuxième article).

XIV, 3; *Pierre Duhem*, Le temps et le mouvement selon les scholastiques quatrième article); *S. Belmond*, Simple remarques sur l'Idéologie comparée de saint Thomas et de Duns Scot; *A. Véronnet*, Les Hypothèses cosmonogiques. Appendice; *Louis de Contenson*, L'innéisme Kantien des fondements mathématiques (fin).

REVUE PHILOSOPHIQUE, XXXIX, 2: *F. Le Dantec*, Considérations sur le repos et le sommeil; *N. Kostyleff*, Bechterew et la psychologie de demain; *L. Dugas*, L'humeur: étude psychologique: *Ossip-Lourié*, Un philosophe russe. W. Soloviov.

XXXIX, 3: *A. Darbon*, Hasard et Déterminisme; *L. Arréat*, Valeurs d'art: Esthétique sociologique; *Spaier*, L'image mentale d'après les expériences d'introspection; *Dontchef-Dezeuze*, L'étude de l'image d'après les travaux de Pavlov.

REVUE DE MÉTAPHYSIQUE ET DE MORALE, XXII, 1: *E. Boutroux*, Religion et raison; *J.-M. Carré*, Un inédit de Fichte; *X. Léon*, Le socialisme de Fichte d'après l'État commercial fermé; *B. Lavergne*, La répartition des richesses comprise comme simple introduction à l'economie sociale; *E. de Michelis*, Les problèmes de la logique selen F. Enriques; *A. Rivaud*, Textes inédits de Leibniz publiés par M. Ivan Jagodinsky; *Th. Ruyssen*, La morale sexuelle (fin.).

REVUE DES SCIENCES PHIL. ET THÉOL., VIII, 1: *M. de Munnynck*, Introduction générale a l'étude psychologique des phénomènes religieux; *M. S. Gillet*, Les harmonies de la Transsubstantiation: le sacrement de l'Eucharistie; *M. Jacquin*, Le "De corpore et sanguine Domini" de Pascase Radbert. *M.-D. Roland Gosselin*, Ce que Saint Thomas pense de la sensation immédiate et son organe.

REVUE NEO-SCOLASTIQUE, 81: *M. De Wulf*, La Genèse de l'Œuvre d'Art; *J. Halleux*, La Déterminisme biologique; *J. Laminne*, La Cause et l'Effet; *G. Legrand*, Maine de Biran et Descartes; *L. Du Roussaux*, La Perception du Monde extérieur; *J. de Ghellinck*, Note: A propos d'un Catalogue des Œuvres de Hughes de Saint-Victor; *M. De Wulf*, Le mouvement néo-scolastique.

ARCHIVES DE PSYCHOLOGIE, XIII, 52; *C. G. Jung*, Contribution à L'Étude des Types Psychologiques; *M. Dubuisson*, Les Oscillations Sensorielle et les Variations de leur Fréquence en Fonction de l'Intensité de l'Excitant; *W. Mackenzie*, Le Problème du Chien Pensant de Mannheim; *J. Larguier Des Bancels et Ed. Claparède*, A Propos du Chien de Mannheim; *Pierre Bovet*, Un Rêve Expliqué.

RIVISTA DI FILOSOFIA, VI, 1: *G. Vidari*, Esordio; *A. Faggi*, Ancora del giudizio particolare; *A. Ruesch*, Il settimo enigma; *A. Tilgher*, Lineamenti di Etica; *M. Losacco*, Le assunzioni; *M. Zanoli-Bianco*, Saggio di una Filosofia della Individuazione; *P. Caraballese*, Il valore e la filosofia; *A. Consorti*, Per una interpretazione delle forme curve degli organismi animali e vegetale; *A. L.*, In difesa della filosofia del diritto; *A. Gnesotto*, Del giudizio particolare.